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DYSOSTOSIS MULTIPLEX WITH SPECIAL REFERENCE TO OCULAR FINDINGS

SAMUEL J. MEYER, M.D., F.A.C.S., AND HENRY B. OKNER, M.D.
Chicago

Dysostosis multiplex is a rarely seen, sharply differentiated syndrome, classified under the group known as "osteodyplasias."

The first two cases were observed in 1919 by C. Hurler at the Munich Pediatric Clinic. Several cases were briefly described later on, mostly by American authors, usually under entirely varying symptoms. The original form of dysostosis multiplex of the "Hurler type" is rarely observed and evidently more seldom diagnosed. About 20 cases have been reported in the literature up to the present time. To this number we shall add another case observed on the service of the senior author, at the Illinois Eye and Ear Infirmary. The patient has been under the care of Dr. Sauer of Evanston, Illinois, as a pediatric problem since early infancy. The unusual findings merit elaboration both from the ophthalmological and pediatric standpoints.

CASE REPORT

G. R., a female, born January 22, 1931, is now seven years old. The parents are healthy and unrelated. The mother is of average height and the father is moderately tall. The parents were about 35 years old at the time of the child's birth. There was no similar condition known in the antecedents, but a son of the father's cousin is obese and is said to have hypopituitarism. The mother's second pregnancy had been a miscarriage at 3 months. A brother, aged nine years, is normal and weighed 5 pounds 3½ ounces at birth. The mother's teeth are slightly irregular and the lower jaw slightly prominent. The father's nose is slightly concave. Otherwise, the parents are apparently normal and showed no other hereditary similarities in common with the child's appearance.

The child weighed 6 pounds and 3 ounces at birth, was delivered by low forceps, and appeared normal. She has been under competent pediatric care since birth, and was breast fed until 3 months old. She has always received sufficient vitamin and food intake. The mother stated that she first noted some peculiarity in the child at 1½ years of age; namely, the abdomen impressed her as being large. However, childhood photographs taken at numerous periods from the time of birth show the earliest tendency to abnormality to be perhaps at the age of one year. Shortly after the large abdomen was noted, flexion and stiffness of the left fourth finger was noticed, and within a year this condition had spread to all the fingers of the hand. Curvature of the spine was also noted at about this time. A brace was applied to the spine when she had reached the age of 2½ years. After 1½ years, it was replaced by a corset that was kept on for 6 months. Improvement of the spine seemed to have resulted.

On May 1, 1934, when she was 3 years

old, the child had bilateral mumps, and shortly afterwards "shaking" of the eyes was noted. Gradually it was noticed that the child could not make out objects very well at a distance. In June, 1937, tonsillectomy and adenoidectomy were performed, and in the mother's opinion the child's vision for distant objects has been improving since then.

The patient had bronchopneumonia in August, 1934, and chicken pox in June, 1935.

She sat up at 6 months; stood up at 1 year; walked at 15 months; had her first tooth at ten months; was able to say simple words at 16 months and short sentences at 2 years.

General Examination

One is immediately impressed by the unusual appearance of the child. There is a suggestion of cretinism and achondroplasia (fig. 1). She weighs 16.6 kilos and is 97 cm. high. There is a tendency to duck-waddle, and genu valgum is present. The feet drag slightly. At one time the child walked almost entirely on her toes. The arms are slightly bent and kept somewhat stiffly to the side. Shoulders and back incline backwards as though balancing the protuberant abdomen.

The skin is soft and light complexioned and reveals no abnormalities. It seems to have a peculiar sweetish musty odor. There is heavy blond hair on the back, extensor surfaces of the arms and forearms, and on the anterior surfaces of the legs. The head is large; the circumference from frontal bosses to occiput is 53.2 cm.; frontal-occipital diameter 19 cm.; bitemporal 14 cm.; and biparietal 14.2 cm. The fontanelles are closed. The light-brown hair is heavy, long, and soft in texture. The forehead is prominent, and the nose is markedly saddle-shaped with large nares. The cheeks are full, rounded, and sagging, the lips thick, and the mouth is moderately large. The tongue is thick and fleshy, but dentition is poor (fig. 2). The maximum number at any time has been only 16 teeth, since the posterior molars have never erupted. Roentgenograms show that permanent teeth are present. The teeth have been filled and five central teeth have fallen out, one above and four below. The enamel of the teeth is soft and thin. The roof of the mouth is moderately arched and long, so that the pharynx is difficult to inspect. The ears are negative as to pathology, with normal drums. The skull presents a moderately prominent temporal ridge above the ears. The eyebrows are bushy with long eyelashes and thick, heavy eyelids. The neck is so short that the head seems to rest on the shoulders, while the thyroid is difficult to palpate.

The anterior and posterior parts of the chest are prominent as indicated in figure 3. The circumference is 58.3 cm., and there is no rachitic rosary. A soft systolic murmur is heard at the apex. The lungs are normal. There is a marked pot belly and umbilical hernia, with a circumference measuring 63 cm. (fig. 4). The liver is palpable two fingers below the right costal arch, and the spleen is palpable two fingers below the left costal arch. Both organs have apparently been more prominent on earlier examination due to the spinal deformity. The labia are well developed and somewhat redundant. There is a scoliosis to the left and a slight kyphosis of the spine at the level of the iliac crests as shown in figure 5. A moderate lordosis is present in the lumbar region.

The shoulders measure 23.7 cm. between the acromial tips. The shoulder joints are fairly movable; the arms can be brought up almost to the vertical. The bones of the arms appear to be stiff and more involved than the lower extremities. Supination of the forearms is only par-

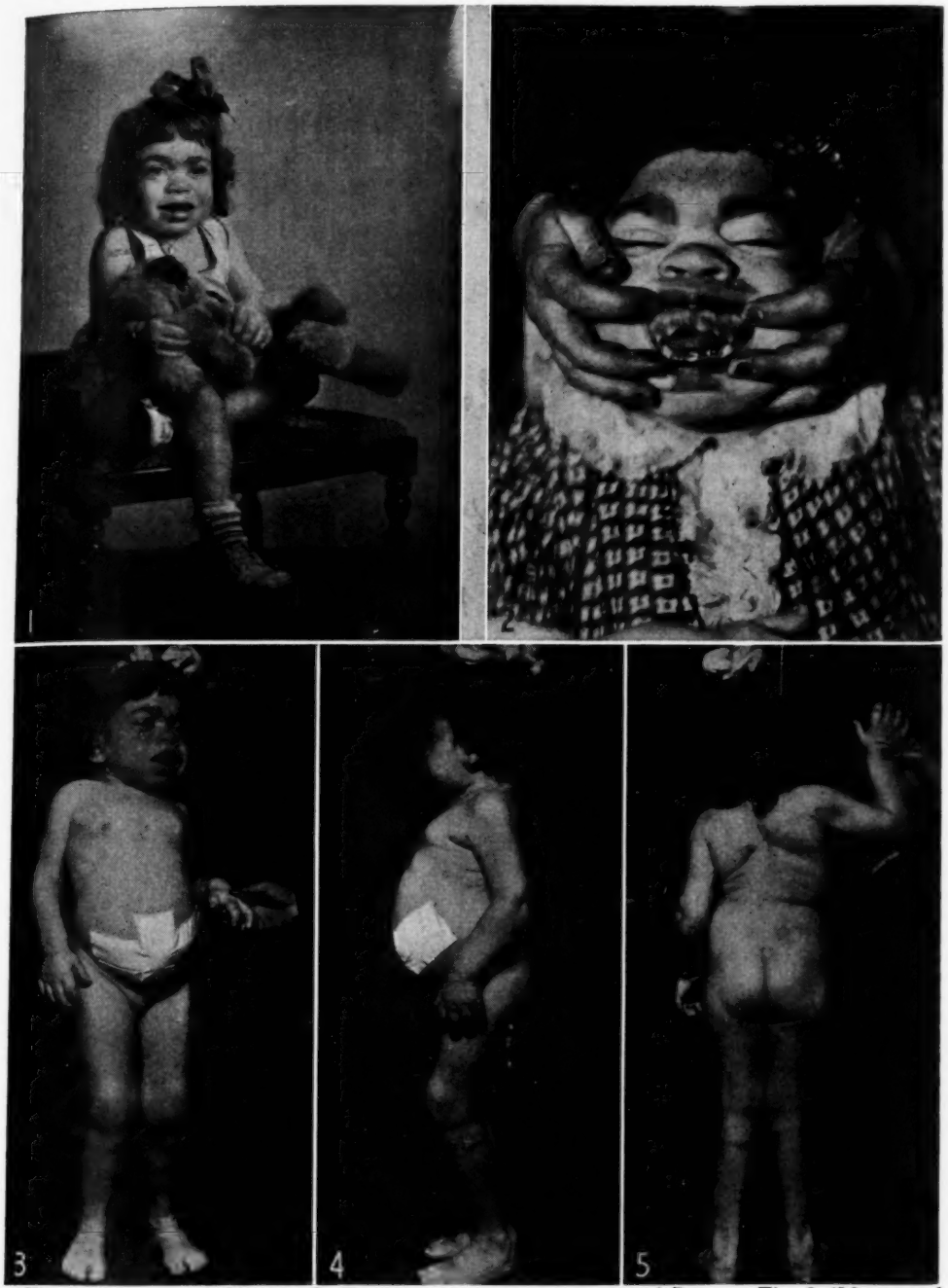

Fig. 1 (Meyer and Okner). G. R., general appearance at age of 7 years. Fig. 2 (Meyer and Okner). Dentition poor. Teeth set apart with tendency to taper. Fig. 3 (Meyer and Okner). Prominence of anterior part of chest. Fig. 4 (Meyer and Okner). Marked pot belly and umbilical hernia. Circumference 63 cm. Fig. 5 (Meyer and Okner). Scoliosis of the spine to the left, and slight kyphosis at the level of the iliac crests.

tially possible. The humerus measures 15.9 cm. from the acromion to the lateral condyle; the ulna measures 12.7 cm.; the wrists are 14 cm. in circumference, with fair mobility. The finger joints are stiff with only partial mobility. The middle finger measures 7.37 cm.

The thighs flex fairly well on the abdomen but the legs flex on the thighs to 45 degrees with difficulty. The femur measures 23 cm. from the greater trochanter to the lateral condyle. The knees are rounded and large with a circumference of 25 cm.; immediately above and below them, the circumference of the leg is 21.6 cm. The bones of the thighs and legs, except for the large knees and genu valgum, appear to be normal. The ankles move freely. The insteps are high, and there is marked pes cavus. The toes are practically normal, but the distal phalanges cannot be hyperextended.

The child's mentality and memory are very good. She is affable, pleasant, and cooperative. An intelligence test by a psychologist was as follows: mental age, 7 years and 2 months; chronological age, 6 years and 3 months; intelligence quotient, 114; basic year, 6; passed 3 tests in the 7th year, 3 in the 8th year, and 1 in the 9th year. Her reaction time is slow; and there is a visual-auditory defect. In a more recent test, an I.Q. of 84 was obtained. She has had practically no schooling until recently, but is able to write simple things.

Her hearing seems to be impaired. She often says "huh" when first spoken to, but since she sometimes seems to hear things which one would not think audible to her, this may be only a habit. A hearing test shows the following: whispered voice, R-6′, L-6′; Rinne R-, L-; Weber R-?, L-?; bone R-18, L-18; air R-7, L-7; Schwabach 8. Diagnosis: otosclerosis (?).

Medication: At 2½ years of age and until recently, the child received mixed gland extract (Female No. 2—Burroughs-Wellcome), two tablets daily, and one yeast tablet daily. She has had cod-liver oil and orange juice in adequate quantities since the age of one month.

Laboratory Findings

Serology: Kahn test—negative; Mantoux—negative.

Blood chemistry:		*Normal*
Calcium	10.5 mg./100 c.c.	9–11
Phosphorus	3.7 mg./100 c.c.	3.7–5.0
Serum albumin	4.7 percent	4.6–6.7
Serum globulin	2.1 percent	1.2–2.3
Bilirubin	Normal	0.1– .25
Nonprotein-nitrogen	27. mg./100 c.c.	25–35
Creatinine	Normal	1–2
Cholesterol	322. mg./100 c.c.	150–190
Fatty acid	670. mg./100 c.c.	
Lecithin	1.3 mg./100 c.c.	

Blood count:

Hemoglobin 70 percent
Red blood cells 4,540,000
White blood cells 5,200
Lymphocytes 52 percent
Mononucleocytes 1 percent
Neutrophiles 45 percent
Eosinophiles 2 percent

Basal metabolic rate: Unsatisfactory test.

Urine: Clear and essentially negative.

Glucose tolerance test:

Fasting	78 mg./100 c.c. blood
9:30	115 mg./100 c.c. blood
10:30	140 mg./100 c.c. blood
11:30	128 mg./100 c.c. blood

Electrocardiographic report:

Tachycardia
R V P
T 1-2 prominent
T 3 low, diphasic
Q 4 small
ST 4 depressed

P 2 prominent
Compatible with congenital heart disease

Roentgenograms

The positive roentgenographic findings when examined on November 24, 1937, at the Illinois Eye and Ear Infirmary by Dr. John H. Gilmore were as follows:

Skull: Marked broadening of the sella turcica in both the antero-posterior and lateral dimensions, with thickening of the posterior clinoid processes, a finding consistent with an intrasellar tumor (fig. 6). The plates of the skull bones are unusually thin, particularly through the vertex. (fig. 7).

Chest: The lung fields are negative. The ribs show a marked tendency toward flaring and blunting at the distal extremities with the spinal attachment and portion of the rib just distal to the articulation markedly narrowed with thinning of the cortex (figs. 8 and 9). The clavicles are thin at their distal extremities and quite clubbed at the sternal ends. The scapulae are small and irregularly formed. There is evidence of growth disturbance at the upper end of the humeri.

Extremities: All extremities and articular components present evidence of growth disturbance with roughening and irregularity, shortening of the bones of the forearms, and poor development of the carpal and tarsal bones. The metacarpals, metatarsals, and phalanges are short and broad and have a distinct foamy appearance with poor trabeculation (fig.

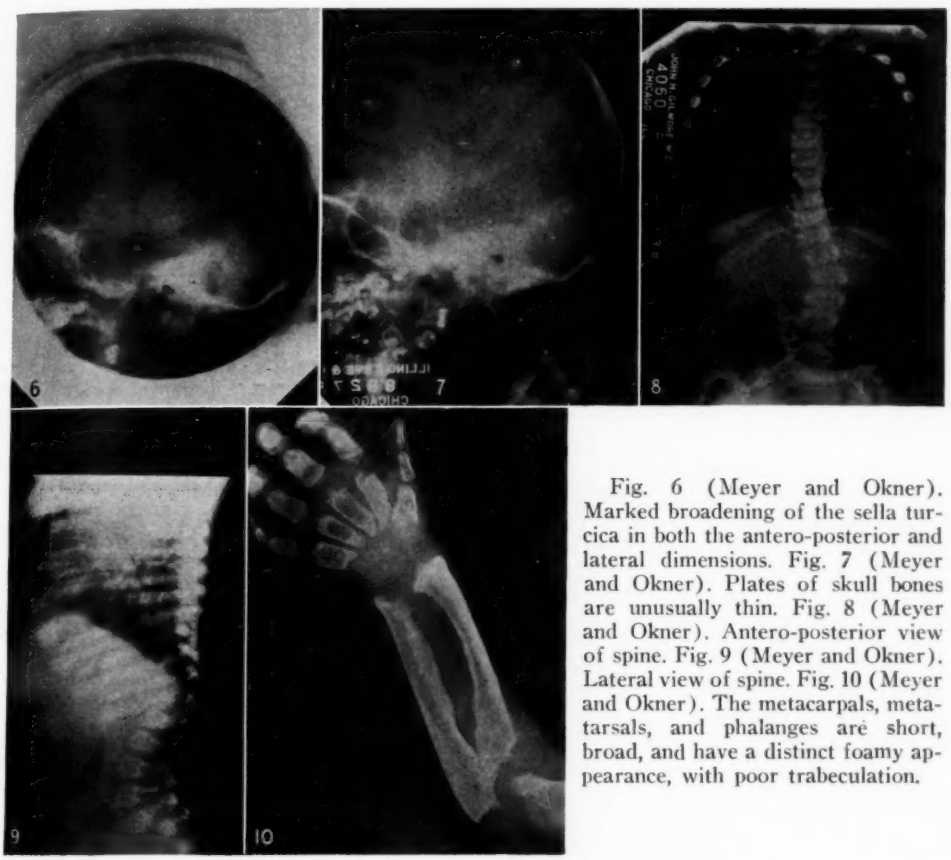

Fig. 6 (Meyer and Okner). Marked broadening of the sella turcica in both the antero-posterior and lateral dimensions. Fig. 7 (Meyer and Okner). Plates of skull bones are unusually thin. Fig. 8 (Meyer and Okner). Antero-posterior view of spine. Fig. 9 (Meyer and Okner). Lateral view of spine. Fig. 10 (Meyer and Okner). The metacarpals, metatarsals, and phalanges are short, broad, and have a distinct foamy appearance, with poor trabeculation.

10). The terminal phalanges are very small and pointed.

Pelvis: The hips present a decided tendency toward coxa-valga deformity. The rami of the ischium and pubis on each side are very thin at their opposing areas.

The findings described throughout the skeletal structure are consistent with and fall in the roentgenographic classification of a form of dyschondroplasia.

Ocular Examination

Both eyes: The lids and surrounding skin are normal. The eyes are parallel. The palpebral and bulbar conjunctivae are pale and normal; no scars are present. The corneae upon superficial inspection reveal a rather marked cloudiness or opacification, which is present over the entire corneal area. There are no scars visible in the cornea. The corneal cloudiness is so marked that details of the deeper structures, such as the iris, pupil, and lens, cannot be clearly seen. With difficulty it can be seen that the pupil is only 2 to 3 mm. wide. No detailed structures of the iris can be made out. The corneae are much larger than normal, measuring approximately 14 mm. in diameter. The megalocornea gives the picture of a congenital hydrophthalmos. However, the tension when measured with a Schiötz-Gradle tonometer under ether anesthesia was found to be 25 mm. Hg in each eye. This measurement was repeated at a later date for verification, when it was found to be 24 mm. in each eye, approximately the upper normal limit. This is, therefore, a true megalocornea or megalophthalmos, and not a congenital glaucoma or hydrophthalmos.

Slitlamp examination of the corneae (frontispiece) revealed the following: The superficial corneal layer is flat and regular; there is evidently no change in the epithelium. In the corneal stroma, diffusely scattered in all the layers, and also in Bowman's membrane, can be seen many small, definitely punctate opacities of a grayish-white appearance. They are quite numerous and thick; in many areas are more marked opacifications, probably due to conglomerations of the small punctate opacities. Such areas are also arranged in small threads and plexiform regions. No definite correlation between these clumps of opacification and the corneal-nerve distribution is observable. There seems to be no change in the endothelium.

The corneal sensitivity appears to be normal. The corneal opacification is so dense that the iris, pupil, and lens details cannot be seen clearly at all. No fundus details can be made out. The vision in the right eye is the ability to count fingers at 6 feet, and light perception in the left eye. We were not able to obtain visual-field measurements due to lack of coöperation.

It was at first believed that we were dealing with a hydrophthalmos, due to the large diameter of the corneae, their cloudiness, and the poor vision present. However, the tension upon several measurements was never found to be over 25 mm. Hg in each eye. We therefore believe that the megalocornea and cloudy cornea are a part of the characteristic picture in the syndrome of dysostosis multiplex. However, in previously reported cases no mention has ever been made of any enlargement of the corneal diameter such as was noted in this case, and, from the ophthalmological point of view, this was the most conspicuous finding in conjunction with the corneal opacifications.

Discussion

Dysostosis multiplex reveals a uniformity in its entirety, yet the individual findings give varying impressions. Ullrich believes the family likeness of these children is as marked as that found in Mon-

golian idiots and other typical combination syndromes of multiple degenerations.

These children, usually the offspring of healthy families, at the time of birth already have a generally enlarged or deformed skull (most frequently a boat-shaped skull, more rarely an acro- or brachycephalic shape of head). After an initial normal growth, there develops a disproportionate dwarfishness or a lack of normal development. The corneal opacification of cloudiness has been present in all the cases reported to date. As pathognomonic for dysostosis multiplex may be mentioned: the massive facial portion of the skull with the broad sunken root of the nose, the large alveolar processes, the thick fleshy tongue, the deformity of the thorax, the acute angle of the lumbar portion of the spine with its limited gibbous formation, the disfigurement of the short, plump limbs, the decrease in movements of the joints, and the clawlike form of the hands, with the contracture in the flexion position of the phalanges. As a rule, there is also present: a large prominent abdomen with deeply developed navel and hernia formation, muscular flaccidity, hypertrichiasis, and liver and spleen enlargement. Occasionally marked mental retardation is also present, but in our case the mentality was about normal.

Differential diagnosis

The demarcation of dysostosis multiplex from the various forms of the degenerative dysostoses is somewhat complicated. The Hurler syndrome presents an isolated picture of congenital origin, many symptoms and findings of which can be recognized during the first year of life, becoming more manifest as the child develops.

In the Morquio syndrome, first presented in 1929, there is a dwarfism due to a generalized disease of the bones. The children are born normal, but at the time they learn to walk, there develop symmetrical deforming changes in the skeletal system, except in the skull and face. No pain is present, but marked functional changes occur. Grotesque changes are found in the thorax, and twisting of the vertebal column occurs. The extremities, at first of normal length, become shortened due to the marked deformities that occur. Outwardly there is a slight resemblance to achondroplastic dwarfism. Sexual and intellectual development are normal. Roentgenologically, there may be found in both diseases marked changes in the vertebral and joint regions. In contradistinction to dysostosis multiplex, Morquio's syndrome has a definitely familial occurrence. No abnormal skull configuration nor corneal opacification is found in the latter.

With the disproportionate dwarfism that is such a characteristic picture in dysostosis multiplex, one must not only consider the disturbance of growth in combination with other malformations, but also the previous history of the child, in order to differentiate the various other forms of dwarfism.

Chondrostrophia—the most familiar form of disproportionate dwarfism—reveals at the time of birth such a characteristic picture, in spite of the variety of individual findings, that there should be no difficulty in differentiating it from dysostosis multiplex.

Rickets may also result in a decreased stature. On account of the body weight, the lower limbs are more deformed than the upper in the osteomalacia form of rickets. There were neither clinical nor roentgenological changes in our case that might even resemble the changes found in severe rickets. The shape of the head is not the typical square-head with the sharp protruding frontal and parietal eminences. The presence of a kyphosis

shortly after birth also points against rickets. The curvature of the spine that is found in rickets is first noticed only after the child begins to sit up and the weight of the body has to be borne. The rachitic kyphosis develops as a hump in the middle part of the vertebal column in contrast to the angular flexion usually found in the upper region of the lumbar portion of the spine in dysostosis multiplex. In contradistinction to the delayed ossification of the epiphyseal lines and hyperflexibility in rickets, one observes an early sclerosis of the epiphyseal lines and a decreased limb function in Hurler's disease. The various accompanying malformations present in dysostosis multiplex, especially the corneal cloudiness, never occur in rickets.

There is nothing similar clinically, with reference to diseases resulting in bodily maldevelopments, such as may be caused by disorders of the glands of internal secretion. When one compares the syndrome found in a thyroid dysfunction with that seen in dysostosis multiplex, the differentiation, at least on paper, is not always simple. Characteristics which one familiarly sees in hypothyroidism are also met with in Hurler's disease; namely, diminution of the entire bodily development, heavy bone structure, clawlike hands, sunken root of nose, broad facies, tendency to hernia formation, and deficient intellectual and psychic development. Although the skeletal system may be deficient in development in hypothyroidism, yet there are no deformities. While thyroid dysfunctions are usually accompanied by late, irregular development of centers of ossification and late closure of epiphyseal lines, the centers of ossification in dysostosis multiplex, even though irregularly formed, usually become ossified at the normal time, and the epiphyseal lines become sclerosed ahead of time.

Roentgenologically and clinically there is no basis for cretinism, with its peculiar bodily and psychic degeneration, and its accompanying goiter formation, mental deficiency, and dwarfism.

Arrested development, caused by disturbances of the hypophysis, can also be ruled out diagnostically. This form of dwarfism reveals graceful bone formation, without deformities, with open epiphyseal lines. Hypophyseal dwarfism is usually accompanied by an underdevelopment of the genitalia and the secondary sex characteristics.

Hanhart's dwarfism should not be confused with the arrested development seen in such a case as is here described. Hanhart's disease is usually of a familial type, while Hurler's disease is usually a single or isolated occurrence. The growth or developmental deficiency begins in the first three years of life, the development previously being normal. It belongs to the type of dystrophia adiposogenitalis. There are no deformities of the skeletal system.

Primordial dwarfism cannot be a cause of this severe disturbance of development. Primordial dwarfs are born as dwarfs, grow gradually, begin to develop at the normal time, and reveal a normal advancement of the centers of ossification and sexual development.

Differentiation of this case from the arrested growth of infantilism is not difficult, as deformity of the skeletal system does not belong to the clinical picture of the latter. The infantile affliction is accompanied by retarded epiphyseal closure, gradual formation of centers of ossification, and infantile proportions. The formation of the sexual organs is retarded. The mentality remains infantile and fails to develop properly.

The differential diagnosis must also include the following large group of degenerative hyper- and hypoplastic dysostoses; namely,

1. Dystrophia periostalis hyperplastica familiaris (Dzierzynski).
2. Dystrophia craniofacialis hereditaria (Crouzon).
3. Dysostosis cleidocranialis hereditaria (Scheuthauer, Marie, and Sainton).

The degenerative basis of these three dysostoses reveals an outspoken familial character. In neither the group of dwarfism nor in that of the degenerative dysostoses alluded to in the differential diagnosis so far, is such characteristic corneal cloudiness found as in Hurler's disease.

The ocular findings that help to differentiate this disease are quite characteristic. They have been mentioned in the literature by Ellis, Sheldon and Capon. However, no case of megalocornea has ever been mentioned previously, and in this respect the present case differs materially from all those heretofore reported. The characteristic changes mainly noted have been punctate and flaky opacities of the corneal parenchyma in an otherwise normal cornea. The fact that there is no evidence of inflammation present, and that the process has remained stationary over a long period of observation, places the symptom-complex in the category of the degenerative corneal diseases.

The question arises as to the classification of this case among the known types of corneal degeneration. Obviously it does not belong in the group of band-shaped keratitis of primary or secondary origin, as this usually occurs in later life and is often unilateral. As the epithelial and endothelial membranes are intact in this case, it can be readily differentiated from epithelial and endothelial dystrophy of the cornea, under the former of which one must include the familial forms of Axenfeld; namely, fatty degeneration, dystrophia calcarea, dystrophia urica, and dystrophia myxedematodes. These changes occur during later life and are characterized by finding the aforementioned substances in the corneal substrata. In fatty degeneration there are found thick, yellow opacities, located usually centrally, only occasionally peripherally, and, as seen with the slitlamp, they appear as clumps, lines, or points, lying close together in conglomerations, while other parts of the cornea are entirely clear. New blood-vessel formation is also present.

Axenfeld's dystrophia calcarea reveals white nodular or linear formed opacities located usually in the periphery. Dystrophia urica as described by Uhthoff is very rare. Here one finds deep, yellowish-gray, gold-glistening punctate opacities, arising at the limbus and spreading towards the center of the cornea. The myxedematous dystrophy of Axenfeld is characterized by white areas that arise in the corneal periphery and spread centrally. They later encroach upon the center and become vascularized.

It can, therefore, be clearly seen that the corneal changes present in this case cannot be placed in any definite classification of the corneal degenerative changes previously mentioned.

We also have to consider the familial forms of corneal changes that occur without vascularization, but have a familial tendency. According to Bücklers, there are three forms: the brittle form, usually located centrally; the speckled or spotted form, in which the entire corneal surface is affected and the epithelium raised in isolated areas; and the latticelike degeneration of Haab-Dimmer. The corneal sensitivity in all these cases is usually altered, but was found unchanged in this case. No hereditary factor has ever been mentioned in any of the cases of Hurler's disease reported to date.

There are also other isolated cases of corneal degeneration that cannot be placed in any single group or classifica-

tion. Included are many cases in which many fine punctate opacities occur in the corneal parenchyma, without any visual disturbance. These are cases of the types reported by Meesmann, Cacchione, Riegel, and de Schweinitz and Cowan. Meesmann's case had no hereditary factor, but differs from our case in that it occurred in adult life and Bence-Jones protein was found in the urine. The cases of Riegel, Cacchione, and of de Schweinitz and Cowan were of a hereditary nature, and were present in several members of a family. Cacchione's patient was an amaurotic idiot.

It can readily be seen that this case cannot be classified with any of the known groups. It must be considered as a specific form of corneal degeneration, it is intimately associated with the clinical picture of dysostosis multiplex, and is evidently a characteristic part of this disease.

Should we desire to include these changes in a separate category under corneal degeneration, it must be considered with the clinical picture and the other symptoms of which it is an integral part. In view of the fact that we have no anatomical nor chemical data involving the substrata, it may be possible that further research may link it up with other processes. In a similar case Hurler has already demonstrated anatomical changes of lipoid degeneration in the brain and optic nerve which reveal a similarity to amaurotic idiocy and Niemann-Pick disease.

The question as to the cause of these corneal changes can be answered only by maintaining that it is an integral part of the entire clinical picture and can be discussed only with the other symptoms.

The dwarfism as such, the infundibular thorax, the angulation of the vertebral column, the deformities of the joints accompanied by the veillike corneal opacifications are seen as restricted endogenous constitutional malformations, as to the causative factors of which nothing definite can be stated.

The condition does not seem to be a hormone disturbance but rather some disruption in the normal cellular process of the body, the exact precipitating cause of which is unknown.

Because of the large sella turcica a pituitary disturbance was at first considered possible. The patient was seen by Dr. Eric Oldberg because of the thought of possible benefit from a transsphenoidal operation on the pituitary, but this was not deemed indicated.

58 East Washington Street.

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LECTURES ON MOTOR ANOMALIES*

XI. Etiology, prognosis, and treatment of ocular paralyses

A. Bielschowsky, M.D.
Hanover, New Hampshire

The etiology of ocular paralysis as the basis for treatment cannot be discussed in detail here, but I should like to refer to some results of my own researches in so far as these results differ from the views recorded in textbooks. An interesting point worth mentioning is the indubitable increase in the percentage of cases of paralysis of the trochlear nerve, which I was able to ascertain by comparison of the material that I collected during the last 30 years with that of the preceding years. This increase cannot be attributed in any way to an improvement in the methods of investigation, since all the cases included in these statistics have been examined solely by myself. Up to the year 1908 the number of cases of trochlear-nerve paralysis amounted to 10 percent of all cases of paralysis, not quite half as many as the cases of paralysis of the abducens nerve. From that time until 1932 the percentage of cases of trochlear-nerve paralysis was about 20, and that of abducens-nerve paralysis the same as before, about 25 percent. I am sure that the striking increase in the number of cases of trochlear-nerve paralysis is due to the introduction of Killian's operation and of similar radical operations on the frontal sinus. These operations came into vogue between 1903 and 1908. In these operations the trochlea recedes into the orbit after the periosteum is cut through. If the operation is finished without the refixing of the trochlea to its original attachment by exact periosteal sutures, the function of the superior oblique muscle is weakened. In the majority of cases this weakness lessens gradually and disappears within a few weeks, but in some cases it becomes permanent and displays the typical manifestations of paresis of the trochlear nerve.

In the 80 cases of trochlear-nerve paralysis that I have seen in my clinic during the years 1923-1932, no less than 15 had been caused by operations on the frontal sinus.

A traumatic origin was found in 15 percent of all my cases of paralysis.

Syphilis and metasyphilis constitute the most frequent cause, and in statistics published years ago the percentage of cases due to these conditions was from 50 to 60. In 1906 I found that 55 percent of my cases belonged to this group, nearly the same as the percentage found by Sauvineau. This has decreased considerably since then. Less than 30 percent of the cases of paralysis collected during the years 1923-1932 were of syphilitic or metasyphilitic origin. In all cases the blood and spinal fluid were examined. The indubitable decrease in the occurrence of ocular paralysis due to syphilis and metasyphilis should be attributed, in all probability, to the modern therapy of syphilis.

Next in frequency are the cases of paralysis of congenital origin and paralysis caused by epidemic encephalitis (14 percent each). I cannot enter into the particulars of the interesting and extremely multifarious disturbances of the oculomotor apparatus that are encountered in cases of epidemic encephalitis and of postencephalitic paralyses and

* From the Dartmouth Eye Institute, Dartmouth Medical School. Read before the Seventh Annual Mid-Winter Clinical Course of the Research Study Club, Los Angeles, California, January, 1938.

spasms. I must also omit discussion of certain well-known etiologic factors, such as, intracranial diseases, anomalies of the blood vessels, and acute infectious diseases. Among the paralyses of toxic origin, those due to spinal anesthetics, especially benzoyldimethylamino-ethyl-propanol, procaine hydrochloride, or tropacocaine, have been numerous and known for a long time; they have been mostly paralyses of the sixth nerve, less frequently of the trochlear nerve, and only exceptionally of the third nerve. As a rule, the paralysis arises a few days after the injection and takes some weeks to disappear. Opinions differ as to whether the nuclei or the nerves are damaged and how they are damaged by the poison. In the course of time the frequency of these paralyses has gradually decreased. During the years 1923-1932, out of 600 cases of ocular paralysis in my clinic, not a single case had been caused by a spinal anesthetic.

Because of its extreme rareness I shall mention two cases of paralysis of the abducens nerve due to severe loss of blood.

One patient had been wounded by a file and had lost an enormous quantity of blood. When he was discharged from the hospital he was extremely anemic and complained of blurred vision and of seeing sparks before his eyes. I found a slight paralysis of the right abducens nerve to be the only cause of his ocular troubles. It diminished slowly and disappeared within a year.

From the second patient a considerable quantity of blood had been taken for the purpose of transfusion. The following day she noticed diplopia and, according to her physician's report, there was paralysis of both sixth nerves. When I saw her some months later she displayed a convergence angle of 20 degrees, that increased neither when looking to the right nor left. Improvement was slow; after 13 months she was finally cured.

Lastly, it should be noted that in spite of the most careful investigation the etiology of ocular paralysis still remains obscure in a comparatively high percentage of cases, in my material in 15 percent.

Prognosis of ocular paralyses

A few comments may be permitted with respect to the prognosis in cases of ocular paralysis. Spontaneous recovery occurred in 38 percent of my cases, the percentage, however, being entirely different for the various forms of paralysis. The highest percentage of recovery (about 57 percent) was found in cases of paralysis of the trochlear nerve, nearly 50 percent in paralysis of the abducens nerve, but only 28 percent in paralysis of the third nerve, in ophthalmoplegia, and in associated paralyses. The reason for these differences is easy to understand. The majority of cases of paralysis of the fourth and sixth nerve are caused either by a trauma or by a tiny nuclear hemorrhage that may be reabsorbed within a short time, whereas in the majority of the other paralyses the lesion is more serious and of greater extent; more than 50 percent are due to syphilis or metasyphilis—factors most unfavorable relative to prognosis. Among the cases of spontaneous recovery from the paralysis, the cases with an obscure etiology constitute the highest percentage. In the majority of these, the paralysis may be of toxic or infectious origin or may be caused by tiny nuclear hemorrhages. Sometimes such paralyses disappear within a few days or even hours, as suddenly as they appeared.

As to how soon operations for the correction of paralytic deviations are advisable, it is important to know that if six months have elapsed since the inception of the paralysis the possibility for

spontaneous recovery is extremely meager. I remember patients with traumatic paralysis who, for six months, presented a constant condition, especially a constant restriction of mobility and a constant angle of squint, after which time they began to improve and continued to complete recovery. Therefore, I never operate for a paralytic deviation until at least six months have elapsed.

Treatment of Ocular Paralyses

As to the treatment of ocular paralysis, the causal indication must be considered primarily. The often surprising results of antisyphilitic therapy in cases of paralysis caused by cerebral syphilis are well known, but even in cases in which the nature of the paralysis cannot be revealed a cure is frequently effected by means of diaphoretics, mercury, iodine, and other medicaments. Patients suffering from cerebral hemorrhages due to disturbances of the circulatory apparatus must take laxatives, have their diet regulated, and remain in bed for several weeks.

The local treatment during the first stage is only palliative. Occlusion of the paralyzed eye to remove intolerable diplopia is often unavoidable, but it must be limited to the shortest possible time because the exclusion of the fusion tendency prevents a compensatory innervation and aids the development of secondary contracture.

As long as the angle of squint does not remain constant in the different directions of gaze, prism spectacles do not help at all, not to mention the fact that, as a rule, prisms stronger than 4 or 5 degrees cannot be endured and, moreover, prisms cannot correct a meridional deviation of the eyes; that is, disclination or conclination. In my opinion, galvanic treatment, though much used, is helpful only as a suggestive measure, for, due to the danger of injuring the retina, the current must be so weak that it does not produce a contraction even of the normal muscles of the eye.

If no success or only partial improvement has been obtained with nonoperative treatment, surgical proceedings must be considered in order to correct the position and, if possible, the mobility of the eye, so that binocular single vision would be restored, at least in the central part of the field of fixation; a good result would, at the same time, remove the anomalous position of the head. There are few operations in ophthalmology so satisfactory as the operations under discussion, provided the oculist has carefully chosen the method best suited to the particular case and provided that, if the case is so complicated that the desired result cannot possibly be obtained by a single operation, the patient has sufficient faith and perseverance to undergo several operations.

The paralytic deviation of one eye must be corrected, if possible, by increasing the efficiency of the paralyzed muscle. This result can be obtained by advancing or shortening the muscle, even if the paralysis is incurable. Wrongly assuming that an ocular muscle as an agonist must overcome the resistance of its antagonist, ophthalmologists formerly thought that the function of a paralyzed muscle might be improved by weakening the antagonist. However, Sherrington has shown that the lengthening of an antagonist in the normal act of vision is not to be understood as a passive stretching produced by the contraction of the agonist, but is due to an active relaxation that takes place even if the agonist does not function at all. It is now realized that it is impossible to improve the function of a paralyzed ocular muscle by weakening its antagonist.

It is due principally to Landolt's persistent propaganda that oculists have

gradually ceased to employ tenotomy in every case of deviation, regardless of its origin. Although paralytic squint may be improved by tenotomizing the antagonist of the paralyzed muscle, this advantage is more than outweighed by the addition of postoperative insufficiency of a normal muscle to the paralysis of its antagonist. In a case of paralysis of the right abducens nerve the result of tenotomizing the internal rectus would be that in the whole field of fixation there would possibly be only one direction of gaze in which the patient could see single. Homonymous diplopia would occur in looking to the right and crossed diplopia in looking to the left side of that direction. Landolt has indeed overshot the mark in his absolute rejection of weakening operations. A long-standing, permanent paralytic deviation of high degree due to a strong secondary contracture of the antagonist cannot be corrected solely by advancement or shortening of the paralyzed muscle. Landolt recommended that if the result of advancement—for instance, of the left external rectus—is not satisfactory, the right external rectus muscle should be advanced in preference to tenotomy of the left internal rectus, which would involve risking insufficiency of this muscle. If the secondary contracture of the left internal rectus muscle in the example mentioned is not corrected and the normal muscle balance of the right eye is destroyed by advancing the external rectus muscle, both eyes will be directed to the right in the position of rest, so that the patient, in order to look at an object in front of him and see it single, will be obliged to turn his head to the left. A habitual anomalous position of the head is certain to result from Landolt's procedure. In the cases under discussion the strong secondary contracture of the internal rectus muscle must be remedied by recession of that muscle with a safeguarding suture preventing an abnormal weakening of the muscle. There is no objection to this, since its excessive function, which does not help the patient in the least, can be reduced to its normal measure without the risk of any disadvantage in the act of seeing.

Operative treatment of abducens paralysis

Advancement and shortening of a paretic external rectus muscle is the operation of choice in uncomplicated cases. This will correct a deviation up to 15 or 20 degrees and restore binocular single vision in the greater part of the field of fixation. The abduction of the paretic eye can become nearly normal.

If the muscle is totally paralyzed, its function cannot be restored, and one must be content to restore binocular single vision in the central part of the field of fixation by improving the position of the paralyzed eye and of the head. The prognosis is much better if the loss of function is caused not by a paralysis but by an unguarded tenotomy, as will be seen in the photographs (fig. 52) of a patient whose internal rectus muscles were tenotomized because of a convergent squint 50 years before she consulted me. The internal rectus muscles, the tendons of which had receded behind the equator, were unable to move the eyes inward beyond the midline. The advancement of these muscles not only produced parallelism of the visual lines when the patient looked straight forward, but also restored a normal amount of adduction. It is easy to understand why the results obtained by one and the same operation differ so fundamentally according to whether the loss of function is caused by paralysis or by recession of the separated tendon beyond the equator. In the latter case the muscle, if innervated, contracts normally, although the effect remains

latent as long as the muscle is attached to the posterior half of the bulbus, whereas the paralyzed muscle does not obtain any innervation even after the operation.

Transplantation of the temporal halves of the superior and inferior rectus muscles to the site of the paralyzed external rectus was first recommended by Hummelsheim (1907). It has not been used as much in Germany as in this country, so far as I can judge from recent publications. Fairly good results are reported, but in all these cases the transplantation was combined with tenotomy of the internal rectus muscle. I have performed transplantations in several cases, but the results were not so satisfying as to induce me to abandon the other and simpler procedures in the cases under discussion. By transplantation one may obtain a decrease in the deviation and even a certain amount of power of abversion, but the patient will not be able to see objects in front of him single with the normal position of the head, and he will not abandon the habit of anomalous rotation of the head toward the paralyzed side.

In long-standing cases of permanent abducens paralysis I make the mode of procedure dependent on the behavior of the antagonistic internal rectus muscle. My main endeavor is to obtain comfortable binocular single vision in the central part of the field of fixation, so that the normal position of the head is regained. If, in spite of total paralysis the deviation is below 15 degrees, the desired result is obtainable by simple advancement and resection of the paralyzed muscle; but in the majority of cases the deviation is of a greater degree, owing to secondary contracture of the internal rectus muscle. Since the adversion in these cases is abnormally increased, in addition to advancing the external rectus muscle the internal rectus should be receded in the manner already described, so as to bring its function down to just normal.

In a third group extreme contracture of the internal rectus muscle holds the visual line nearly immovable at the inner canthus. In most cases of this type the paralysis is caused by fracture of the base of the skull. An example is shown in figure 53A to F.

Fig. 52 (Bielschowsky). Total loss of function of both internal rectus muscles due to an unguarded tenotomy. There is deficient adduction of each eye in levoversion and dextroversion (A and B). After advancement and shortening of the internal rectus muscles the visual lines are parallel (C) and the adduction of both eyes has become normal (D and E).

The patient, an automobile racer, had been unable to race for more than two years because of disturbing diplopia. He had consulted many oculists and had been told that his condition was inoperable. The man could be made fit to resume his work only by providing him with binocular single vision in the primary position of his head and eyes. To obtain this, the function of the enormously contracted right internal rectus muscle had to be sacrificed almost completely. I resected 15 mm. of the internal and advanced the external rectus muscle as far as possible in order to prevent a disfiguring exophthalmos. The photographs show the result: In looking straight forward with the head in its normal position the visual lines are parallel and are kept in this position without effort. Although the side-to-side movements of the right eye are almost abolished, so that the patient has homonymous or crossed diplopia, as

he looks to the right or to the left, he is happy because he can race as successfully as before his accident. He is not disturbed by diplopia because he substitutes the lost eye movements by the corresponding movements of his head; in near work he uses spectacles with one opaque glass. More than nine years have passed since the operation and he has recently written me of another race that he has won.

I have repeated the procedure described, in several similar cases, with good results. It is surprising how quickly, usually within a few days, the patients learn to avoid diplopia by turning their heads as a substitute for the lost muscular functions, and so unobtrusively that persons with whom they are talking do not notice the absence of certain ocular movements.

Fig. 53 (Bielschowsky). Paralysis of the right external rectus with extreme contraction of the internal rectus muscle. There is extreme deviation of the paralyzed eye while the other eye is looking straight forward (A). Excessive adduction of the right eye occurs if the patient is looking to the left (B). The cornea of the right eye remains in nearly the same adversion if the patient looks to the right (C).

After operation the visual lines are parallel in the primary position of the eyes and there is binocular single vision of distant objects (D). The right eye remains in the primary position if the left eye is looking to the right (E). Adversion of the right eye is restricted a little in looking to the left (F).

Sometimes the paralyzed eye is used permanently for fixation because of amblyopia of the nonparalyzed eye. As a rule, considerable contracture develops in the internal rectus muscle of this eye. In such cases this muscle may be weakened without danger, since neither diplopia nor an anomalous position of the head need be feared. Otherwise the weakening of the internal rectus muscle of the paralyzed eye without simultaneous advancement of the external rectus muscle would give rise to an ugly exophthalmos. If a simple operation would produce the same cosmetic and functional result as a complicated operation the former must, of course, be chosen.

Operative treatment in trochlear-nerve paralysis

Comparing the function of the external rectus muscle with that of the superior oblique, it is obvious that paralytic deviation in trochlear-nerve paralysis cannot be corrected so easily as in paralysis of the abducens nerve, for in the former three deviation components must be considered: a vertical, a rotating, and a lateral component; the last, however, is of subordinate importance.

Before one can decide whether and how a vertical deviation can be corrected by operation, the following questions must be answered: 1. Does the vertical deviation increase in looking up or in looking down? 2. Is it different in the right and left halves of the field of fixation? 3. Are the double images of contours parallel in the whole field of fixation or only in a certain part, being inclined toward each other in the other part? 4. Does the tilting of the head around the sagittal axis without changing the direction of the visual lines influence the magnitude of the vertical and the meridional deviation, and, if so, in what manner? Only after these questions have been answered by a careful examination is one in a position to know whether the deviation is due to nonparalytic heterophoria or to paralysis of one or several vertical motor nerves of the right eye or the left, and what operative procedure to adopt.

I shall consider first the procedure in a typical case of inveterate trochlear-nerve paralysis that presents both vertical and meridional deviations, increasing or decreasing in the various parts of the field of fixation. I do not think it advisable to strengthen the function of a paralyzed superior oblique muscle because of its insertion in the posterior half of the globe. The disturbed vertical balance of the eyes—namely, the disturbed harmony of position and movements of the eyes—must be restored in another way. But tenotomy of the superior rectus muscle of the eye with the paretic superior oblique is a wrong method and must be definitely rejected because it ignores the physiologic functions of the vertical motors. One might indeed obtain an improvement, possibly even a removal of the vertical deviation due to trochlear-nerve paralysis, through weakening of the superior rectus muscle, but only for a small central part of the field of fixation. In the lower half, where the vertical deviation had been greater before the operation, the effect of the operation is less than in the central part; whereas in the upper part, where there had been only a small vertical deviation or none at all before the operation, there may even be an overcorrection; that is, the contrary vertical deviation. If the patient is looking toward the sound side, the vertical position of the paralyzed eye depending mainly on the oblique muscles, the vertical deviation due to paralysis of the trochlear nerve increases in proportion to the increasing adversion of the paralyzed eye, whereas it decreases in looking to the opposite side, because the vertical position of the abverted eye is influenced mainly by the vertical rectus muscles. Instead of getting the maximum operative effect on the paretic deviation of the adverted eye, tenotomy of the superior rectus muscle produces the maximum effect on the abverted eye and the minimum on the adverted eye, again an undesirable result. More unsatisfactory still is the effect of tenotomy of the superior rectus muscle on the meridional deviation (disclination) in trochlear-nerve paralysis. This deviation is increased by weakening the superior rectus, which is likewise an inward rotator muscle. The same disadvantage is also prejudicial to the effect of an advancement of the inferior rectus muscle, as recommended by Landolt for trochlear-nerve paralysis. The only advantage of this operation compared with tenotomy of the superior rectus muscle is a better correction of the vertical deviation in the lower part of the field of fixation, but only in its central part, as it is inadequate in the nasal quadrant of the lower half of the field of fixation.

Albrecht von Graefe's genius and his familiarity with the physiology of the muscles of the eye revealed the right way in which to remedy the aftereffects of paralysis of the trochlear nerve. He was the first to perform tenotomy of the inferior rectus muscle of the sound eye in order to equalize the function of the associated depressor muscle of the two eyes. Stevens, Worth, Landolt, and other eminent authors have objected to Graefe's procedure because, while the weakening of the sound inferior rectus muscle would perhaps yield a good result as regards the primary position of the eyes, it would cause an overcorrection in looking down. This possibility must of course be considered, but it can be avoided if the inferior rectus muscle is not simply tenotomized but weakened just to the extent needed to counterbalance the weakness of the paralyzed superior oblique muscle. If this is successful, the vertical and the meridional deviation will disappear in nearly the whole field of fixation, and the normal position of the head will be restored. This is easy to understand if one

considers that the left superior oblique and the right inferior rectus muscle are associated in so far as both these muscles have the maximum influence as depressor muscles if the eyes are turned to the right and the minimum influence in the opposite side of the field of fixation; further, they incline the upper end of the vertical meridians to the right, so that the extorsion (disclination) caused by a paralysis of the left trochlear nerve is diminished or even transformed into parallelism when the right vertical meridian, by weakening of the right inferior rectus muscle, is rotated inward; that is, to the same (left) side as the left vertical meridian. The oblique position of both vertical meridians does not interfere with vision, provided they have become nearly parallel. This so-called compensatory operation has proved successful in many cases of paralysis of the trochlear nerve when indispensable precautions have been taken to prevent overcorrection.

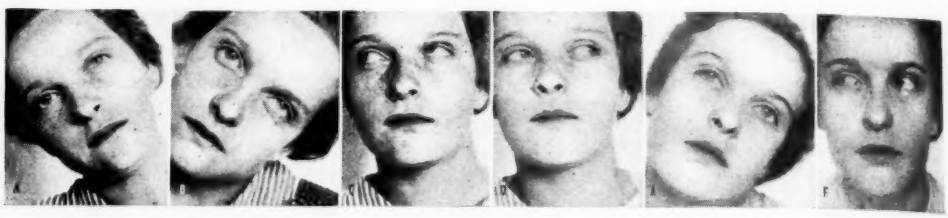

Fig. 54 (Bielschowsky). Paralysis of left trochlear nerve with habitual torticollis: binocular single vision with the head tilted toward the right shoulder (A); considerable left hypertropia when the head is tilted toward the left shoulder (B); left hypertropia if the eyes are turned to the right (C); while the hypertropia disappears in levoversion (D).

After retroplacement of the right inferior rectus, binocular single vision even while the head is tilted toward the left shoulder (E) or the eyes are turned to the right (F).

I perform this operation in the following manner: After the conjunctival incision, the inferior rectus muscle is separated from the fascia and the fibers connecting the muscle with the conjunctiva. Then the needles of a double-armed suture are inserted through the tendon from the posterior to the anterior surface and through the conjunctiva bulbi, but through the peripheral part of the latter, near the region where it turns into the fornix or, if a high degree of vertical deviation must be compensated for, within the fornix. The ligature is tied loosely, not knotted twice, so that I am able, if necessary, to lessen or intensify the effect of the operation the following day. A careful suture of the conjunctival wound is necessary to prevent drooping of the lower lid, producing a poor cosmetic result. Figure 54A-F and figure 55A, B show examples of compensatory weakening of the left inferior rectus muscle in cases of paralysis of the trochlear nerve. Drooping of the lower lid occurred after a simple tenotomy of the inferior rectus muscle (fig. 55A). A careful suture of the conjunctival wound following recession of the inferior rectus muscle prevented drooping of the lower lid (fig. 55 B).

In the majority of cases of incurable paralysis of the trochlear nerve a contraction of the inferior oblique muscle prevents the decrease of the vertical deviation in looking upward as seen in typical cases, and finally the deviation becomes entirely independent of vertical movements, as was discussed in the second lecture. In these cases, recession of the inferior rectus muscle of the other eye can, to be sure, correct the deviation in the lower half of the field of fixation, but it is not sufficient for the correction in the upper half and in the horizontal plane.

Since, in most cases of this kind, the function of the inferior oblique muscle is excessive, it may be weakened by severing it from its origin and resecting a few millimeters of it. There is no danger of obtaining an overeffect, as I was able to verify in more than 50 cases. If a considerable amount of vertical deviation remains in the lower part of the field of fixation some weeks after the myectomy of the inferior oblique muscle, one may proceed to recession of the inferior rectus of the other eye, as has been previously described. To perform these two operations in the reverse order is less expedient, because it is easier to bring about a gradation of the effect in a recession of the inferior rectus muscle than in myectomy of the inferior oblique.

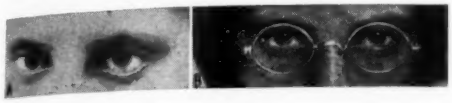

Fig. 55 (Bielschowsky). Compensatory weakening of the left inferior rectus muscle in a case of paralysis of the trochlear nerve. Drooping of the left lower lid occurred following a simple tenotomy of the inferior rectus muscle (A). After a careful suturing of the conjunctival wound following recession of the inferior rectus muscle there is no drooping of the lower lid (B).

Similar to the cases under discussion are the cases of congenital anomalies, which I have described as overaction of the inferior oblique muscles, from the lack of evidence indicating primary trochlear-nerve paralysis. In almost all the congenital cases torticollis is displayed as the first sign in earliest infancy, inducing the child's mother to consult a physician. In the second lecture I spoke of the orthopedic and surgical treatment that is frequently given in such cases, because the practitioner overlooks the ocular origin of the torticollis. In most cases of this kind it is as surprising as it is gratifying to observe the child spontaneously straightening the formerly tilted head as soon as the ocular-muscle balance has been restored. This fact is easy to understand: The tilting of the head helps the patient to avoid diplopia, which is caused by the excessive functioning of the inferior oblique muscle or of the insufficiency of its antagonist, as the case may be. That the disturbed balance between the oblique muscles is the only reason for the habitual tilting of the head is proved by the results of myectomy of the inferior oblique muscle followed, if necessary, by recession of the inferior rectus muscle of the other eye. As soon as the vertical deviation and the meridional disclination have been corrected and binocular single vision has been restored with the head in the normal position, the tilting of the head is abandoned.

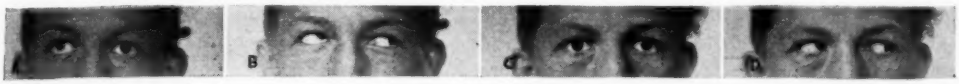

Fig. 56 (Bielschowsky). Divergent strabismus (right eye) with overfunction of the right inferior oblique. In the primary direction of gaze the right eye is deviated out and slightly up (A); in levoversion the excessive functioning of the right inferior oblique brings about a considerable right hypertropia (B). After bilateral advancement of the internal rectus with a displacement of the right one below the horizontal meridian perfect parallelism of the eyes (C); even in levoversion no right hypertropia is noticeable (D).

The congenital overaction of one or both inferior oblique muscles is sometimes combined with a nonparalytic squint. If the former anomaly is not of too high a degree, it can be corrected by displacing one or both of the horizontal rectus muscles below the horizontal meridian of the bulbus. As a rule, the usual advancement and recession opera-

tions of the external and internal rectus muscles are sufficient also for the correction of the vertical deviation just discussed. Figure 56A to D shows a patient with a divergent squint of 25 degrees combined with an exceedingly high degree of so-called overaction of the right sixth- and fourth-nerve paralyses cannot, of course, be obtained in total paralysis of the oculomotor nerve, mainly because of the simultaneous deficiency of both the elevator and the inferior rectus muscles. In most cases, however, one can obtain not only a cosmetic improvement but also

Fig. 57 (Bielschowsky). Paralysis of the right oculomotor nerve due to tabes dorsalis. The upper lid cannot be raised voluntarily (A), but is lifted involuntarily when a levoversion impulse is given (B) to which the right internal rectus does not react. After an advancement and shortening of the right internal rectus and recession of the right external rectus, the visual lines are parallel in the primary position (C), binocular single vision is restored, adversion considerably improved (D), and abversion is normal.

Fig. 58 (Bielschowsky). Paralysis of the right oculomotor nerve due to fracture of the base of the skull six years previously. Right eye immovable, except outward, marked ptosis (A), which disappears when an impulse for levoversion is given (B). Result of an advancement of right internal and recession of right external rectus binocular single vision in primary direction of gaze (C) and in the right half of the field of fixation. Surprising restoration of adversion of right eye (D).

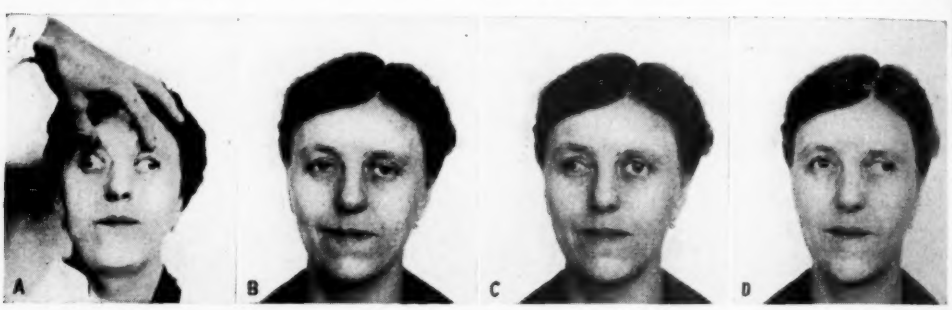

Fig. 59 (Bielschowsky). Bilateral paralysis of oculomotor nerve (A). Binocular vision for primary direction of gaze restored by operation; parallelism of visual lines in primary direction (B); adversion missing in lateroversion (C and D).

inferior oblique muscle. Advancement of the internal and recession of the external rectus muscles of both eyes effected perfect binocular single vision. In such cases, if the result concerning the vertical deviation component is not adequate, a myectomy of the inferior oblique muscle is required.

As great an improvement as in the binocular single vision, at least in a certain central part of the field of fixation. The first and main task to be accomplished is the removal of the paralytic divergence by advancing and shortening the internal rectus combined, if necessary, with weakening the antagonist. When parallelism of the visual lines is obtained, the patient learns quickly to find the posi-

tion of the head in which balance exists between the vertical motor muscles and to replace the deficient vertical movements of the eyes with corresponding movements of the head.

The photographs (figs. 57A to 60C) of some of my patients with total paralysis

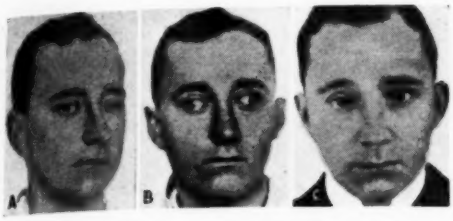

Fig. 60 (Bielschowsky). Total paralysis of both third nerves with enormous secondary contraction of both external rectus muscles caused by congenital syphilis. The patient habitually turned his head to the left in order to fixate an object straight in front of him; the left eye closed to avoid diplopia (A). In the primary position of the head, the paralytic deviation amounted to 60 degrees (B). After advancement and shortening of both internal rectus muscles and recession of both of the external rectus muscles there is binocular single vision with the head in the normal position, the visual lines being parallel in looking straight forward (C).

of one or both oculomotor nerves may show cosmetically satisfactory if not always functionally perfect results obtained by advancement of the internal and recession of the external rectus muscles.

I should like to say a few words about ptosis operations. For all patients whose superior rectus muscle functions normally, the Motais operation, in which the middle third of the superior rectus muscle is substituted for the paralyzed levator palpebrae, should be the operation of choice. This procedure, based on the physiologic synergy of the movements of

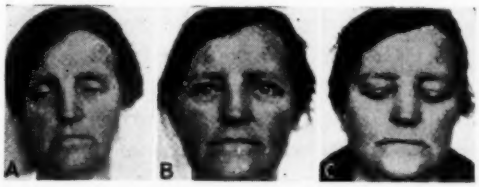

Fig. 62 (Bielschowsky). Result of the von Blaskovics operation in a case in which the Motais operation was not applicable on account of a paralysis of the superior rectus muscles. The upper lids cover the upper halves of the corneas (A). After a von Blaskovics operation the lids assume a normal position (B). They can be relaxed when the eyes are looking down (C) just as completely as after a Motais operation.

the eyeballs and the upper lids, gives highly satisfactory results; but it is not advisable to use it on young children, because a child's superior rectus muscle is so small and delicate that the suture may easily cut through it. The photographs (figs. 61A to E) show a case of congenital bilateral ptosis. The palpebral fissure can be opened a little only by a strong innervation of the frontalis muscle. The successful result of the Motais operation, performed on both eyes, is seen in the photographs. The upper lids accom-

Fig. 61 (Bielschowsky). Congenital bilateral ptosis. The lid fissures are narrow (A); they can be opened a little more only by a strong innervation of the frontalis muscle and by an upward movement of the eyes (B). After a Motais operation there is binocular single vision in the primary position (C), in looking up (D), and in looking down (E). Both upper lids accompany the vertical movements of the eyeballs in the normal way. Particularly valuable is the complete relaxation of the elevator muscles of the upper lid in looking down; this cannot be obtained by the Hess operation.

pany the elevation as well as the depression of the eyes in the normal physiologic manner and are also in the normal position in looking straight forward. When

the Motais operation is not applicable, because of the complete absence of function of the superior rectus muscle, the operation recommended by von Blaskovics gives the most satisfactory results, as is demonstrated by the photographs (fig. 62A to C). The upper lids cover the upper halves of the corneas (A). After a von Blaskovics operation the lids assume a normal position (B). They can be relaxed just as completely when the eyes are looking down (C) as after a Motais operation. In this operation a fragment of the superior tarsus is removed, and after resection of its peripheral part the levator muscle is attached to the residue of the tarsus. The Hess operation is still popular because of its simple technique, but it does not allow for the physiologic synergy of the lid and ocular movements, since the upper lid, after it has been attached to the frontalis muscle, cannot be lowered when the eyes look down. I have therefore abandoned this operation.

MIXED-CELL TUMOR OF THE LACRIMAL SAC*

JOSEPH L. McCOOL, M.D.
San Francisco

Mixed-cell tumors occur commonly in the salivary, parotid, and lacrimal glands and in the buccal mucosa. Mixed tumors of the lacrimal sac are very rare.

These neoplasms are of complex structure, usually presenting epithelial elements in the form of cell strands and neoplastic tissues, chiefly cartilage, mucous tissue, and connective tissue. Any one of these elements may predominate, forming nearly pure chondromas, sarcomas, or carcinomas, but usually all the cell types are represented.

There has been a controversy regarding the origin of these tumors, some writers maintaining that they are epithelial, others claiming that they are endothelial in origin. Of late, the theory of the endothelial origin of these growths has been abandoned, but their histogenesis is by no means complete, as no single source meets all the requirements, some being adenomatous, others extraglandular, and taking the form of basal-cell epitheliomas.

Age appears to play no part in their formation, cases being reported in patients from 11 months to 73 years of age.

The clinical course varies greatly, depending largely upon the histologic type of the tumor. After removal, encapsulated growths rarely recur, although occasionally surgical interference is followed by recurrences of increasing malignancy, the secondary growth becoming more cellular. Thus spindle-cell and round-cell sarcomas have been observed after extirpation of chrondrocarcinoma.

De Vincentiis[1] in 1877 was probably the first to report a case of epithelioma of the lacrimal sac, and he pointed out the danger of confusing this with the thickened sac wall of dacryocystitis.

Piccali[2] in 1895 and Dalén[3] in 1901 published cases of epithelioma of the lacrimal sac, the latter's case occuring in a man aged 24 years, following extirpation of the sac. Guibert in 1905 mentioned an epithelioma that was cured by the X ray after eight treatments were applied

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over a period of four months. The radiographer observed that improvement was attained only after fairly intense radiodermatitis had been produced.

Following Guibert, Rollet[4] in 1906 reported two cases in which the sacs were extirpated because of slight swelling and a concomitant dacryocystitis. Microscopic examination showed the sacs to be filled with neoplastic tissue.

Posey's[5] second case was that of a man, aged 74 years, who had what was believed to be a mucocele of the lacrimal sac. The sac was extirpated. During the operation the sac wall ruptured, discharging a small quantity of pus. The mass was about the size of a horse chestnut and, when examined microscopically, proved to be a primary tubular epithelioma. To obviate a recurrence, radium tubes were applied on three different occasions, and after two years no recurrence was noted.

Morestin[6] in 1908 reported a case in which radiotherapy had failed. Sac extirpation with transplantation of a forehead flap brought about a good result.

Pasetti[7] in 1913 published a most comprehensive paper reviewing the literature and adding a case of his own, occurring in a man, aged 73 years, in whom the tumor was the size of a small nut, the overlying skin being normal and readily movable over the mass. The growth was of hard consistency, and there was no sensation of fluctuation. The cavity of the sac was obliterated, except in its central portion, where, on extirpation, a purulent secretion was found. Pasetti asserts that although tumors of the sac are rare, the surgeon should always bear in mind the possibility of their occurrence, and, in all suspected cases, should advise extirpation rather than other forms of operative procedure. Despite apparently complete removal, recurrences are not uncommon.

The case reported by Butler[8] in 1914 was that of a girl, aged 17 years, from whom a tumor of the lacrimal sac was removed that later proved to be a small round-cell sarcoma. The earliest sign was edema and thickening around the sac, with occlusion of the lacrimal duct. Butler believed the lesion to be tuberculous and advised extirpation. Later there was a recurrence in the orbit and antrum of the same side and an extension through the palate to the opposite side of the face and the other antrum and orbit. With recurrence the morphology of the growth changed and it became a so-called spheroidal-cell sarcoma in which many cartilage cells could be seen. Surgery, of course, failed to check the progress of the disease, and the patient died.

Sarcomas of the lacrimal sac have been reported by Sgrosso,[9] Maauro,[10] Silvestri,[11] Matteson,[12] Maggi,[13] Butler,[8] Zannoni,[14] Singer,[15] Strado,[16] and Margotta.[17]

Papilloma and malignant papilloma were reported by Denti,[18] Hildén,[19] and Heich.[20]

Verhoeff and Derby[21] and Cardello[22] reported cases of plasmoma of the sac.

Lymphomas were reported by Weave,[23] Cavaniglia,[24] and by Sédan, Astier, and Caudière.[25]

Case report

The case which I wish to present is that of a man, aged 54 years, who consulted me in April, 1931, complaining of tearing and the presence of a mass in the region of the left lacrimal sac. He had first noticed lacrimation about six months before consulting me, but paid no particular attention to this until some months later, when he became conscious of a small lump over the site of the lacrimal sac. Although the mass was not painful at any time, the growth was increasing in size and made the patient apprehensive as to its nature.

The lids, conjunctiva, and anterior ocular segment were normal. An attempt to pass a solution through the drainage apparatus, of course failed. There was no discharge through either punctum as a result of this procedure.

On inspection, the mass appeared to be about the size of a small cherry, and occupied the site of the lacrimal sac. Inasmuch as the skin over the mass was normal in color and not particularly tense, I assumed that I had to deal with a mucocele of the sac. However, upon palpation the skin was found to be of normal texture, and freely movable over a small, almost bony hard mass. This mass was not painful to palpation, and no secretion exuded through either punctum as the result of pressure. Its position and slight mobility argued against a diagnosis of exostosis, and its density against that of a mucocele.

The mass was extirpated without difficulty, as it was not adherent to the surrounding structures.

Pathologic report.—Gross examination: A soft, yellowish, translucent mass, measuring 1 by 1 by 1.5 cm.

Paraffin section.—At one edge of the section there was ciliated epithelium; in the underlying tissues there was marked round-cell infiltration which in places formed lymphoid nodules. Separated from this by a dense connective-tissue septum was a mass of apparently neoplastic tissue composed of a mixture of fibroblastic tissue, round cells, and cells of indefinite shape, with somewhat large, quite clear nuclei, oval or round in shape, and without distinct nucleoli. Mitotic figures were common in some areas among these cells. Clear myxomatous areas were present in a small amount. There was infiltration of all the types of tissue between the striated muscle fibers at the edges.

The picture presented was that of a mixed-cell tumor similar to those so frequently seen in the salivary glands (myxochondroepithelioma).

Diagnosis.—Mixed-cell tumor of the lacrimal sac.

As soon as the malignant character of the lesion was established from the pathologic report, the patient was referred to Dr. Laurence Taussig, who implanted radium in the cavity from which the tumor had been removed.

I saw the patient 10 months after the operation and there had been no recurrence. I realize, however, that so short a time does not preclude the possibility of a recurrence, but inasmuch as I have not seen the patient since, I am unable to say whether there have been any metastases or whether the patient is still living.

Lymphoblastoma of lacrimal sac, subsequently affecting the entire lymphatic system (Sédan, Astier, and Caudière)

A woman, aged 44 years, appeared at the Hospital of the Conception on July 25, 1938, suffering from a seemingly trifling lacrimal disease resembling dacryocystitis, complicated by a large but not painful abscess. When the abscess was opened, only a small amount of pus escaped. The operative reactions were normal, and at the end of three weeks the only thing remaining was a large painless lump. The patient then consulted another physician who performed a series of painful cauterizations. At the end of 30 days the patient began to see double. She returned to her first doctor, who found an absolutely painless tumor occupying the internal angle of the eye, pushing the eyeball outward. The neoplasm grew so rapidly that the patient decided upon an operation. When the lacrimal sac was removed, it resembled in shape and consistency a lobulated suet pudding; it was connected with an intraorbital mass of the same appearance. The

latter was removed at a second operation. The appearance of the sac is best described by comparing it microscopically with the tissue of the pancreas and the salivary glands.

The patient went home on the sixth day. Diplopia had disappeared, vision was perfect, and it remained so throughout the course of the disease. Three weeks after the operation the tumor reappeared very suddenly. In the course of a few days it became as large as the growth that had recently been removed. Radiotherapy was tried, a total dosage of 4,000 roentgen units being given. With seven treatments the tumor vanished completely; the diplopia disappeared after three treatments, the only sequelæ being rarefaction of the fat in the cavity, a slight enophthalmos, and a convergent strabismus. On August 20th the preauricular lymphatic system became greatly involved. From August to December the tumor invaded the cervical chain of lymphatics. During December and January the malar regions, the inguinal region, and finally, by the end of January, the mediastinum, became involved.

Each radiation series was entirely successful. Tumors in the regions treated disappeared within 20 days, to appear later in more remote regions. The extreme malignancy of the tumor, rather than radiotherapy, was responsible for the metastases.

After the axillary and inguinal glands became involved, dyspnea, suffocation, and cachexia occurred, and the patient died on March 1, 1929, seven months after the tumor was first diagnosed.

Histopathologic examination.—A diagnosis of lymphoblastoma was made. After fixation with Bouin's fluid, the tumor was found to be extremely homogeneous. Throughout, the growth was composed generally of round or oval elements. These were independent of one another, juxtaposed with free intercellular spaces between. With the exception of occasional capillary vessels, they alone composed the tumor.

After staining, the cells appeared as large and round, in general measuring from 10 to 15 microns, occupying four fifths of the entire mass, with fairly clear nucleus, and infrequent and small chromatic granules. The nucleus was surrounded by a thin protoplasmic covering; occasionally the cytoplasm was more abundant, and on one part of the periphery at least overflowed the nucleus enough to be easily seen.

After coloration with hematin, eosin, and saffron, the cytoplasm was a deep violet blue, and the dark-blue nucleus showed more clearly the structure already described.

After the use of Giemsa's stain, the results were especially clear. The cytoplasm was a dark blue, absolutely homogeneous, without a trace of granulation; the nucleus was reddish purple, and clearly showed its structure and its karyosomes. Mitosis occurred throughout the tumor. Occasionally small, homogeneous elements with a dark-blue nucleus were found; these had a basophile cytoplasm, while resembling lymphocytes rather than lymphoblasts.

The connective tissue constituting the stroma of the tumor was practically nonexistent; connective-tissue fibers were lacking, and blood vessels were rare. From this it was deduced that the cells of the neoplasm were of lymphoid origin, representing cells only slightly differentiated from lymphoblasts; for this reason the tumor was considered a lymphoblastoma.

Lymphatic tumor of the lacrimal sac (Weve[23])

A man, aged 59 years, was operated on for tumor of the lacrimal sac. Among hundreds of surgical lacrimal-sac cases seen at the Rotterdam clinic, no tumor

had ever been found. Paraffin sections did not at once differentiate between a round-cell sarcoma and a lymphoma. The blood picture was: Hemoglobin, 90 percent; red blood corpuscles, 4,560,000; white blood corpuscles, 7,300. Leucocyte formula: basophiles, none; eosinophiles, 1 percent; myelocytes, 0.5 percent; juvenile forms, none; red nuclears, 4 to 5 percent; segment nuclears, 70 percent; lymphocytes, 17 percent; large mononuclears, 4.5 percent. The cervical lymph glands had been swollen for six months. The growth was removed by operation. It was diagnosed as a lymphoma, and could probably have been treated successfully with X rays.

Papilloma of the lacrimal sac (Heich[20])

A woman, aged 39 years, was examined on August 19, 1929. She complained of swelling at the site of the lacrimal sac, and of blood in the eye since August 16th. As a child she had had bleeding, and tumors were removed five times during childhood. Vision was 6/6 in each eye, and both eyes were normal.

Pressure over the right lacrimal sac released a blood-stained discharge through the punctum into the conjunctival sac, and on further pressure blood escaped.

A diagnosis of papilloma was made, and operation was decided upon. The lacrimal sac was greatly distended and the wall was very thin. Palpation revealed the presence of a firm, nodular swelling in the sac. Before dissection was completed the thin wall ruptured, revealing a large papilloma. The growth was very friable, and had to be removed in pieces. There was no evidence of recurrence.

Pathologic report.—Simple papilloma. The growth was composed of cylindric cells on a definite basement membrane with a vascular core of fibrous tissue.

Papilloma of the lacrimal sac (Denti[18])

A woman, aged 50 years, was examined on November 19, 1920. Epiphora of the right eye had been present for several months, and at the same time a small, painless tumor developed at the internal angle of the affected eye. Pressure released some pus.

Examination disclosed a round, soft, elastic, and painless swelling in the region of the right lacrimal sac. Pressure released a few drops of pus.

Diagnosis.—Chronic dacrocystitis with ectasia of the lacrimal sac.

Operation.—Local anesthesia. The sac was removed *in toto*, and a section through the largest diameter of the mass was made. The mass was grayish-red in color, about the size of a pea, gelatinous in consistency, and adherent to the inner wall of the sac.

The tumor was fixed in a 10-percent solution of formalin. Some sections were cut with the microtome, and others were immersed in paraffin.

The papillomatous structure of the growth was rendered apparent under slight magnification, and under higher power the papillæ presented a central stroma composed of connective tissue with many blood vessels; within this stroma there were collections of lymphoid cells. The stroma was enveloped by a stratified epithelium. There was no sign of a typical proliferation, and absence of mitosis was also noted.

Malignant lacrimal-sac papilloma, being also an example of cellular metaplasia of the lacrimal system (Hildén[19])

Neoplasms of the lacrimal system are very rare. According to Hildén, only one case of papilloma of the lacrimal sac was found in the literature (Hermann). Sev-

eral cases described as papilloma had been considered histologically unsustained by Hock and Presbergen. These authors believe that the growths were inflammatory granulations.

A youth, aged 18 years, had lacrimation for several months, when minute tumors of the lower caruncle developed. These were removed, but recurred. A portion of a tumor that was accessible was cut away and the growth was diagnosed as a papilloma. The numerous mitoses, however, did not appear to be entirely benign. The papilloma displayed several layers of stratified epithelium. The lower layers contained prickle cells with intercellular communications. The horny layer was well defined, with epithelium and connective tissue definitely separated. There was abundant vascularization. The tumor recurred in three months, and for this reason the lacrimal ducts were slit. The growth was found to have filled completely the sac to which it was adherent. The sac was removed. Histologically, it proved to be a typical papilloma.

Lymphomesothelioma of the lacrimal sac (Cavaniglia[24])

The patient, a man aged 50 years, reported that for about six months he had had a watering of the right eye and had observed in the internal angle a small swelling which was not painful even to pressure. Examination showed a swelling the size of a small hazelnut in the lacrimal sac. There was no evidence of inflammation, since it appeared to be a chronic dacryocystitis with ectasia of the lacrimal sac, and moderate pressure forced out a viscous yellow liquid. Laboratory tests, the Wassermann test, urine test, skin test, were all negative. The tumor was removed in the usual manner by extirpating the lacrimal sac and thoroughly scraping the nasal lacrimal canal.

Histologic report.—A fragment of the tumor was fixed in a 10-percent solution of formalin, and microtome sections were stained with eosin, Giemsa's stain, and so forth. Throughout the connective-tissue stroma, with alveoli varying in size and shape, there was a parenchyma composed of elements with a protoplasm colored by an acid stain and a relatively small nucleus. A few neoplastic cells appeared in the mesothelium of the lymphatic spaces. Although karpyokinesis was rare, and sometimes atypical, it was easy at this point to observe discrete division. Throughout the stroma of the blastoma was an inflammatory infiltration with polynuclears, lymphocytes, and a few plasma cells.

Plasmoma of the lacrimal sac (Cardello[22])

The patient was a man, aged 54 years, suffering from chronic dacryocystitis and epiphora affecting both eyes. In the lacrimal secretion were numerous plasma cells. The left lacrimal sac was removed.

Microscopic examination.—In the first sections containing the capsule an enormous circumscribed infiltration was found. The mass was surrounded by bands of connective tissue, forming almost a capsule, which continued into the connective tissue. The submucosa infiltration continued in the form of an involucrum. The intraparietal mass advanced in polypoid form into the cavity, partially occupying it, and then became smaller until, in the intersections, it was observed mainly as a uniform subepithelial formation. In some sections in the center of the mass there were formations that presented a glandular aspect and were made up of large cylindric cells with a great amount of protoplasm.

Numerous polymorphonuclear leuco-

cytes were found immediately under the epithelium, as mentioned above. The epithelium was proliferated in one part and in another it was exfoliated, leaving large areas empty.

Staining by Pappenheim's method showed that the tumor was composed almost exclusively of plasma cells, with a few lymphocytes on a reticular stroma full of blood vessels. There were a great many cells of the epithelioid type, with a large nucleus and an irregular arrangement of the chromatin. Polymorphonuclear leucocytes were found not only within but also beside the vessels of the plasmoma, and were analogous to those which were found within the vessels of the periphery of the sac.

Epithelioma of the lacrimal sac (Pasetti[7])

The patient was a man, aged 42 years. A hard, painless lump had appeared in the angle of the left eye about one year before he applied for treatment. The examination revealed a lump the size of a hazel nut, skin normal, slight secretion, and some reddening of the conjunctiva. The growth was diagnosed as a primary neoplasm of the lacrimal sac. On operation the tumor appeared to be fibrous. Hemorrhage was only slight.

Sections of the tumor, fixed and mounted in paraffin, were stained according to Bielschowsky's and van Gieson's methods.

The substance of the tumor appeared to be composed of numerous zones, round in form, and with ramifications. These zones were more deeply stained, due to the abundance of nuclei, and were separated from one another by a prolific fibrous tissue with few nuclei.

Toward the center of the section there appeared stratified epithelium, in some points composed of several layers of cells. In the peripheral section of the tumor interpapillary substance abounded. This substance was composed of very fine connective tissue developing principally in a horizontal direction. The cavity of the sac was not perceptible, nor was there any trace of its wall.

The cells were cylindric in shape near the periphery of the neoplasm, and cube-like or polygonal in the center of the mass. All these cells contained oval or round nuclei.

The arrangement of the cells in the connective tissue of the tumor was in a horizontal direction. The cells were elongated, with spindle-shaped nuclei, in the dense parts of the connective tissue. In other portions the cells were round, with large nuclei.

The epithelial tissue of the tumor contained a small amount of protoplasm, but no trace of intercellular substance. The nuclei were reticulated with chromatin. Karyokinesis was frequent.

Microscopic findings identified the tumor as of epithelial origin, anaplastic in type, derived from a developing epithelium. The cells were generally cylindric or polyhedral; their arrangement and appearance were partly like those of alveolar carcinoma and partly like papillary cancer. From its general appearance the neoplasm was considered malignant.

Diagnosis.—Primary carcinoma of the lacrimal sac with cylindric cells derived from cylindric epithelium of the mucosa of the lacrimal sac.

Death occurred soon after operation from a cause not related to the tumor.

Epithelioma of the lacrimal sac (Fenton)

A woman, aged 49 years, had been treated 16 years previously for an intractable roughening of the nasal skin near the inner canthus of the left eye. Salves and X rays had been used, but the lesion advanced across the bridge of

the nose, leaving the skin with the appearance of having been burned by the roentgen rays.

Three-and-one-half years ago a hard swelling appeared at the inner canthus of the right eye. Square plaques of radium relieved the pain and diminished the redness, but the swelling around the sac increased.

On examination on January 17, 1922, a smooth, hard, slightly tender swelling, including both the caruncle and the lacrimal sac, was disclosed. Epiphora was constant. The puncta were normal in size. Radical excision of the growth, including as much skin and periosteum as was possible, was done on January 20th, under gas and ether anesthesia. The inner thirds of both lids, the skin, and the periosteum of the lateral aspect of the nose, and the lacrimal sac as far down the nasal duct as possible, were extirpated. Both canaliculi and the caruncle were removed. The resulting circular defect left one third of the cornea bare, and measured 3 by 5 cm. in diameter. Finally 10 mg. of radium needles were stood upright in each nasal duct, and allowed to remain for seven hours. Normal drainage through the nasal duct occurred one week after operation.

Microscopically, there was seen an irregular mass of stratified squamous epithelium showing evidences of rapid growth. Malignant infiltration extended from the tissues around the eye along the wall of the lacrimal sac.

Pathologic diagnosis.— Squamous-cell carcinoma. Six weeks after operation the first plastic operation was done. Three months after excision of the growth the opening had been reduced to 15 mm. and the second plastic flap was made. Ten months after the excision the patient noticed an enlargement and hardening of the skin flap and that the eye became red and painful. A smooth, hard mass bulged up under the flap, attaching it firmly to the lacrimal bone, and inhibiting abduction beyond 10 degrees. A prompt application of radium was made, and 3½ months later another application was made. The eye had again whitened, and the growth, although still hard, was smaller. Abduction was still limited.

Sarcoma of the lacrimal sac (Matteson[12])

The patient was a boy, aged 12 years. The tumor was first noticed two months previously. It grew rapidly until, at the time of examination, it had reached the size of a hen's egg. It was firm and elastic, and the skin and the tumor were adherent. Neither pain nor tenderness was present. The left eye was entirely normal.

Pathologic examination of a fragment of the mass disclosed it to be a small round-cell sarcoma.

At operation a tumor closely attached to the periosteum of the nasal and malar bone was found. The internal membrane was peeled off, leaving an apparently healthy base beneath. None of the orbital tissues appeared to be involved.

Thirty-six days after the growth had been extirpated a firm, small nodule could be felt in the cicatrix. Puffiness and induration of the skin flap were present. A few days later a moderate degree of exophthalmos was observed. Pain confined to the eyeball now appeared for the first time. The patient was discharged as incurable. Forty-four days after an operation, in which all the visible signs of the growth had been removed, recurrence had taken place, and the sarcoma could easily be recognized as arising from three foci—one under the reflected skin flap, arising from the vicinity of the nasal bone; a second deep in the orbit, and a third near the lower part of the malar bone.

One hundred days later the tumor had advanced through the orbit, pushing everything before it. The eye had been completely destroyed, and a few shreds of corneal tissue were all that remained. About a month later the boy died.

THREE CASES OF NONULCERATED CARCINOMA OF THE LACRIMAL SAC (Rollet[4])

Case 1.

Latent primary carcinoma of the sac (epithelioma); extirpation of the sac *en bloc*.

The patient was a man, aged 65 years, who had suffered with epiphora for two years. For one year there had been a growth the size of a hazelnut in the internal angle of the left eye. Pressure released pus by nostril and canaliculi. Tumor was removed *en bloc*.

Microscopic section.—A fragment of the tumor and of the surrounding fibrous tissue was embedded in paraffin and stained. The wall was thick toward the anterior part of the sac, and fibers of the growth assumed a circular arrangement.

The internal surface of the sac was covered with round, flattened papillae. These papillae were formed by submucous derma, and this tissue was independent of that of the tumor itself, which was completely separated from the sac by a fibrous spur. However, behind the point of the spur the neoplasm had invaded the posterior wall of the sac. Complete union existed between this tissue and the submucosal neoplasm of the sac. The derma of the mucosa was composed of very thin areolar connective tissue, containing round or oval cells with large nuclei. A few cells were polygonal in shape and of epitheloid aspect.

Epithelium: At the top of the papillae the epithelium had lost its cylindric cells, retaining the polygonal ones with large nuclei. In some places there was no clear line of demarcation between the epithelium and the tumor cells. The epithelium took the shape of a spur between the papillae, and its cells appeared to be larger. Epithelial cells penetrated into the tissue without a line of demarcation and without losing the large nuclei.

The extrasaccular portion of the tumor was divided by connective tissue into round eyelets; the cells were variable in form—sometimes round, and at other times elongated. Some rare ones of epithelioid appearance were oval and polygonal, with deeply stained nuclei and abundant protoplasm.

Due to the obvious infiltration of the derma of the mucosa by epithelial cells, a diagnosis was made of malignant tumor of the mucosa of the sac of epithelial nature, atypical in form, with concomitant inflammatory phenomena.

Case 2.

Latent primary carcinoma of the sac with a sarcomatous polyp. Removal *en bloc*.

The patient was a woman, aged 61 years, who gave a history of a blow on the nose a few months previously, followed by swelling of the internal angle of the right eye. Epiphora with purulent discharge developed.

Examination revealed a soft tumor the size of a hazelnut. Operation: Removal *en bloc*.

Pathologic Examination.—The wall of the sac was thick, the external portion being composed of hyperplastic connective tissue with occasional groups of round cells. The mucosa in general was flat at the top of the papillae. The epithelium was cylindric and stratified, and its cells were extremly elongated. Bottle-shaped unstained spaces appeared here and there. The mushroomlike tumors had no mucous covering. The submucous tissue was epithelialized by embryonic cells.

The tumor itself was composed of connective tissue with fibers arranged in the form of a trellis. Deep down in this

tissue were numerous vessels filled with red globules, some with double and others with single endothelial walls. The vessels increased in number toward the surface of the growth. Also deep in the connective tissue were found cells in karyokinesis, embryonic cells with large, highly colored nuclei, and cells with clear, elongated nuclei as well as double nucleoli resembling sarcoma cells.

Below the mucosa the areolar connective tissue merged into tissue composed of round alveoli also with large nuclei, and little protoplasm. At times the cells underwent a change in shape, becoming elongated, fusiform, with clear nuclei. These were true sarcoma cells. Some nuclei were much larger than others and contained large nucleoli.

Diagnosis.—Sarcomatous polyp of the lacrimal sac.

Case 3.

Secondary carcinoma of the lacrimal sac (alveolar melanotic sarcoma of choroidal origin). Removal *en bloc.*

The patient, a woman, aged 57 years, had been struck in the right eye by a cow's horn 20 years previously, and two years before had received a blow in the same eye. Later, a tumor appeared. Removal of the tumor, and later enucleation of the eye, revealed a melanosarcoma of the choroid.

Pathologic examination.—After fixation in formalin and inclusion in paraffin, the sac was divided into two parts by transverse section. The cells were sometimes fusiform, and at other times round, with large, vividly colored nuclei. Less pigmented melanotic cells without visible nuclei appeared throughout, closely resembling the cells of the choroid. These cells were sometimes star shaped. Here and there round sarcoma cells were seen, with large nuclei having no coloration.

Diagnosis.—Alveolar melanotic sarcoma of the lacrimal sac of choroidal origin.

450 Sutter Building.

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TUBERCULOSIS OF THE CONJUNCTIVA*

Report of a case

Walten H. McKenzie, M.D.
Saint Louis

The clinical types of tuberculosis of the conjunctiva that are recognized today are best grouped according to Sattler's classification as shown by Bordley[1] and again by Eyre.[2] These are, briefly, as follows.

Group I. Miliary grayish ulcerations of the conjunctiva which may coalesce.

Group II. Grayish nodules in the conjunctiva resembling trachoma follicles.

Group III. Massive reddish-colored proliferations of the conjunctiva, resembling a cockscomb.

Group IV. Lupus of the conjunctiva, characterized by a uniformly thickened conjunctiva, grayish-covered ulcers, and a tendency to cockscomb formations.

Group V.** Pedunculated tumors of the conjunctiva resembling papillomata, fibromata, or polyps.

Groups I, III, and IV occur most frequently. Group III is represented as being seen twice as often as either I or IV. The other two groups, II, and V, are rarely observed. Lesions due to endogenous or secondary origin are unusual, according to Eyre.[2] Schieck,[3] on the other hand, wrote that by far the majority of cases of conjunctival tuberculosis were secondary in origin.

Dr. John Eyre, in his Hunterian Lecture delivered before the Royal College of Surgeons of England, in 1912, held that the type of tuberculous conjunctival lesion is dependent on both the number and virulence of the organism introduced into the tissues and on the varying susceptibility of the individual. Groups I and III represent the infection of a nonresistant individual with a number of virulent organisms, while groups II and V include resistant individuals infected with attenuated organisms.

Frequency. Tuberculosis of the conjunctiva is rarely seen in this country. Bordley, in 1902, reported that out of 41,730 treated eye cases in the Baltimore Eye, Ear, Nose, and Throat Charity Hospital, not one case had been reported. The records at Washington University Eye Clinic did not disclose a single previously diagnosed case. Isolated cases in this country have, however, been reported by Henderson,[4] Thompson,[5] Hansell,[6, 7] Peter,[8] Jackson,[9] Shoemaker,[10] Cohen,[11] Coover,[12] and others. In Europe where the disease is uncommon, though not so rare as in the United States, Mooren in 100,000 treated eye patients failed to recognize a single case. Samuelson[13] working in the ophthalmologic clinic at the Seraphimer Hospital reported that during the period from 1915 to 1934 there were only seven cases of tuberculosis of the conjunctiva in a total of 181,000 patients, making, a frequency of almost 1:26,000. Three of the seven cases were considered of primary origin. He estimated that primary tuberculosis of the conjunctiva therefore occurred there in a ratio of 1:60,000. In 1936, he reported three cases that he had seen in the previous 12 months, all of which he considered as primary in origin. Eyre gives the frequency of other writers (Hirschberg, 1:17,000; Horner, 1:4,000; Milligan 1:20,000; Mules, 1:33,000; Spangenberg, 1:17,000; Remlinger, 1:1,900; Bock, 1:10,000; Lagrange and Cabannes,

* From the Department of Ophthalmology, Oscar Johnson Institute, Washington University School of Medicine.

** Group V was added by Eyre.[2]

1:7,500; Stephenson, 1:1,500; Pegorora, 1:13,500; Saemisch, 1:1,660; Gourfein, 1:1,600; Casali, 1:300; and Guy's Hospital Record, 1:3,200) between 1881 and 1912.

Age and sex incidence. Most workers stated that the disease was seen most frequently during the first 20 years of life. In Samuelson's[13] cases 66 percent, in Eyre's 67 percent, and in H. Villard's[14] 72 percent were found to be 20 years old or younger. The former two workers reported that women were afflicted twice as frequently as men. Prior to 1905, only one case had been reported in the Negro race (Villard[14]).

Location. The tuberculous lesions are found most often in the palpebral conjunctiva (70 percent), in the bulbar conjunctiva (22 percent), and in the fornix (8 percent), according to Villard. It has been noted that these lesions are encountered most commonly in the upper eyelid where foreign bodies are prone to lodge.

Eyre pointed out that prior to laws to control tuberculosis in cattle, the bovine bacillus was given credit of causing 20 percent of all the conjunctival lesions. In Copenhagen at the Finsen Institute, 4 patients out of 40 were considered as being infected by the bovine organism.

The preauricular and regional lymph glands were almost always infected. Such lymph-gland involvement was found in 27 of Eyre's 29 cases, in each of the three cases reported by Samuelson in 1936, and in 85 percent of Villard's proved cases. Samuelson strongly believed that the regional lymph nodes are always infected in the primary and never in the endogenous cases.

Symptoms. The complaints of an individual with conjunctival tuberculosis are usually trivial and misleading. These patients, as a rule, seek medical advice because of an itching eye, a swollen or droopy eyelid, mild lacrimation, persistent photophobia, or a preauricular swelling, as the first symptom observed. Pain is conspicuously absent and is present only as a result of secondary infection with associated ulceration and swelling, or as a result of corneal involvement. The latter is rarely present and then only late in the disease. Valude[15] held that the organism was unable to penetrate the intact corneal epithelium.

Differential diagnosis. The differential clinical diagnosis is frequently very difficult and must be made from granulomatous trachoma, lues, vernal catarrh, Parinaud's conjunctivitis, and epithelioma. The diagnosis is certain only through guinea-pig inoculation, or the discovery of the organism in specially stained smears of the secretion or in tissue-section.

A biopsy is important. The presence of the specific cytologic changes of tuberculosis in the excised tissue is sufficient to justify a diagnosis.

In the cases reported in the literature, the tubercle bacillus was found in only 25 percent on examination of the secretion or excised tissue (Samuelson[13]).

The tuberculin test, though unreliable, was present in 99 percent of the patients with tuberculosis of the conjunctiva.

Microscopic appearance. The microscopic findings of tuberculosis of the conjunctiva as reviewed by Löhlein[16] showed in the conjunctival lesions of group I, through biopsy, typical miliary tubercles with central caseation in a granulation tissue rich in cells and tubercle bacilli. In group II, tubercles of epithelioid and giant cells were observed, having little caseation, few bacilli, and mild lymphoid infiltration of the vicinity. Prepared sections from the conjunctival processes of group III showed a granulation tissue with small round cells and fewer specific cells of tuberculosis than in the first two groups. Tubercle bacilli were present in scanty numbers. In group IV, the con-

junctiva affected with lupus was characterized by an extension of the process over the surface with the formation of smooth, contracting cicatrices in the conjunctiva and little tendency to caseation. The tuberculous process in group V differed in being composed of connective tissue enclosing epithelioid and giant cells and was only slightly prone to ulcerate or show caseation.

Report of a case

On July 30, 1937, J.R., an 18-year-old colored girl, was referred to the Washington University Eye Clinic by an ophthalmologist because of a "sore" on her right eyelid which had failed to respond to treatment. The patient stated that approximately one year previously she had picked a "lump" on the right upper eyelid with her fingernail. Subsequently, the lid became red, swollen, and painful. Later history revealed that at this time the patient was in rather close contact with persons believed cured of pulmonary tuberculosis. The lid lesion grew progressively worse in spite of prolonged treatment. The general health had been good. The patient denied any injury or infection of eyes prior to the present disease. The family history revealed nothing of significance.

Examination. Vision, O.D. was 6/15 —1 without glasses, O.S. 6/12 —2 without glasses; after determination of the refractive error, which was correctable with O.D. —1.00 D.sph., O.S. +75 D. cyl, ax. 140°, it was 6/12 in each eye. There was much irregular lenticular astigmatism in each eye which would not yield to correction.

The right upper eyelid drooped, was thickened and swollen (fig. 1), particularly in its outer one third, where it was pushed away from the eyeball. The lashes were very sparse for a distance of 3 mm. adjoining the outer canthus. There was present some excoriation of the skin in this region. The adjoining palpebral conjunctiva was thickened, red, and studded with raised granulomatous papules about 1.5 mm. in diameter.

The right lower eyelid was involved in a similar manner but here the process was much more extensive and pronounced, extending approximately 16 mm. from the temporal canthus. In this area the lashes

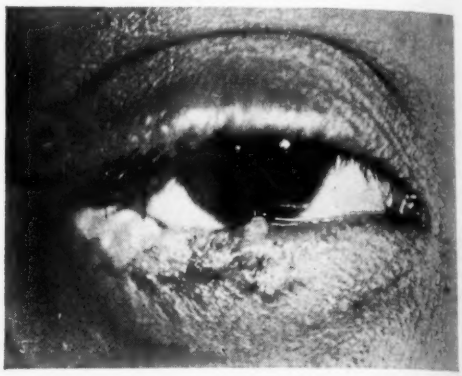


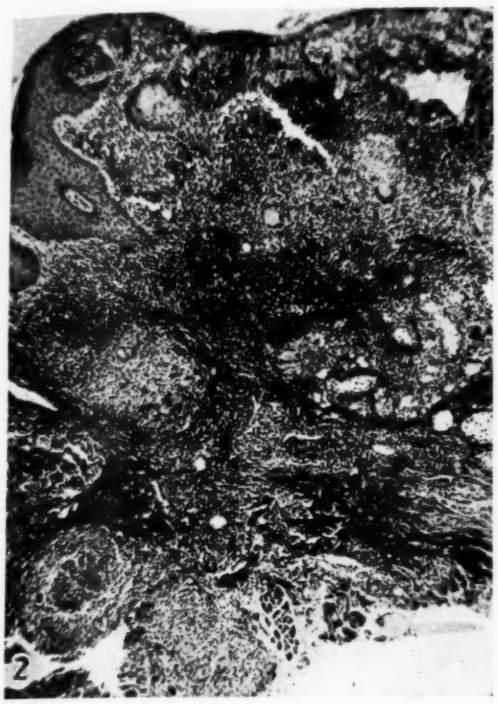
Fig. 1 (McKenzie). Showing the appearance of the eyelids when the diagnosis was first made and before X-ray therapy. Note the lower lid, the loss of the eye lashes, the mottled appearance of the skin, and the tuberculous papule.

were absent (fig. 1) and the skin was grayish white and mottled for 3 to 4 mm. below the lid margin. The latter presented a pale grayish moth-eaten appearance. The underlying conjunctiva presented alternating deep-red and light grayish-pink areas which apparently had broken down, being very soft to palpation. The lower palpebral conjunctiva and lid margin were covered by a mucopurulent secretion which tended to cause the eyelids to adhere near the temporal canthus.

The lacrimal apparatus, the bulbar conjunctiva, and the sclera appeared normal. The pupil was round, regular, and active to light and accommodation. The cornea was clear, as were the remaining media. The keratometer showed minimal corneal astigmatism; retinoscopy, marked irregular lenticular astigmatism. The fundus presented no changes from the normal. The left eye and eyelids showed no pathologic changes other than the lenticular

astigmatism, as was observed in the right eye. The external ocular movements of both eyes were intact; a mild horizontal nystagmus was present and believed to be congenital. The tension was normal in both eyes.

such with hot saline compresses and the usual ocular antiseptics. The edema and inflammation partly subsided, but since progress was not satisfactory and the tuberculin test had been so markedly positive, a biopsy was performed. At the same time tissue was excised for guinea-pig inoculation.



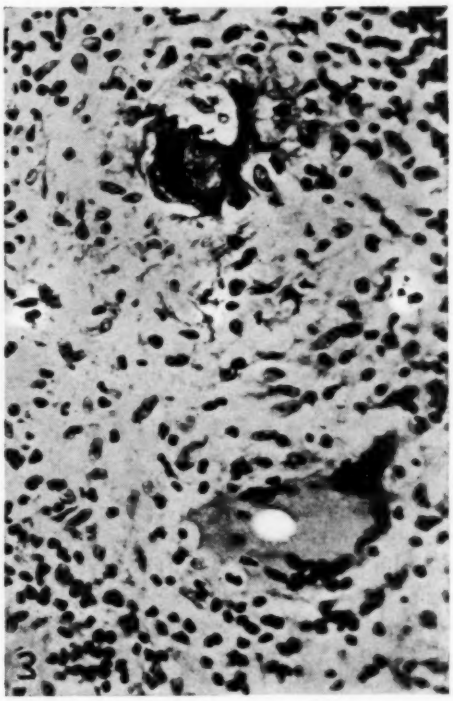


Fig. 2 (McKenzie). Section through tuberculous tissue under lid margin to the left and under palpebral conjunctiva to the right. Light-colored areas are groups of epithelioid cells. ×40.

Fig. 3 (McKenzie). Section through tuberculous tissue of eyelid showing two giant cells immediately surrounded by epithelioid cells and in the periphery small lymphocytes and plasma cells. ×340.

The general physical examination, together with Kahn* test, urinalysis, blood counts, and chest X-ray studies, was negative. The tuberculin test was markedly positive. The preauricular and cervical lymph glands were not involved.**

The case was first diagnosed as an ulceration of the eyelid and treated as

*The Kahn test was negative when first taken in August, 1937; however, when repeated in March, 1938, it was found to be 4+. Antiluetic treatment was instituted.

**There was no lymph-gland involvement until August, 1938, when a gland below the angle of the right jaw became acutely inflamed.

Pathology. The histologic findings in the case of two biopsies were reported by Dr. Harvey D. Lamb: A biopsy removed from the thickened conjunctiva of the right lower eyelid on August 28, 1937, showed papillary hypertrophy and dense infiltration with small lymphocytes and plasma cells. In a few places within the infiltrated tissue, occurred small nodules of epithelioid cells with an occasional giant cell. Numerous fibroblasts, indicating incipient cicatrization, were observed.

On September 27, 1937, a biopsy was taken across the margin of the right lower eyelid at its most affected part. Sections from this specimen (fig. 2) showed the epidermis of the skin and lid margin to

Fig. 4 (McKenzie). Showing the appearance of the eyelids five weeks after the institution of X-ray therapy. The papule had almost disappeared and the skin was assuming a more normal appearance.

present numerous thick and long downgrowths and many additional layers of flattened cells with a thick stratum of keratinization. The epidermis was mildly infiltrated with scattered pus cells. The covering epithelium of the inner-lying conjunctiva was generally a little thickened, with an occasional broad and short downgrowth. The underlying tissue was characterized by dense infiltration with small lymphocytes and plasma cells, enclosing numerous islands of large and small size, composed of epithelioid cells and many giant cells (fig. 3). Toward the skin side of the specimen occurred large groups of fibroblasts in the densely infiltrated tissue.

Conclusions. The cytology of the excised specimen was typically that of tuberculosis of the conjunctiva and lid margin.

The guinea pig, inoculated with affected tissue from the lower eyelid, subsequently developed pulmonary tuberculosis and died.

Treatment. The conjunctival and skin lesions continued to spread under symptomatic and general treatment. Surgical removal and cauterization were discarded temporarily because of the positive resulting mutilating effects. X-ray treatment was advised and given by Dr. Sherwood Moore. Within one month after X-ray therapy had been instituted, the hypertrophied papules had disappeared, the skin and conjunctiva (though scarred) were assuming a fairly normal appearance (fig. 4). However, the upper eyelid suffered a flare-up of activity in February, 1938, while the lower lid remained quiet. Further X-ray treatments were given and greater efforts made to improve the patient's general health with increased dosages of cod liver oil, rest, sunshine, plus the drinking of milk and fruit juices. Progress was good until August, 1938, when a small papule developed on the approximating lid margins of the upper and lower eyelids at the junction of the outer two thirds with the inner one third. At the same time a lymph gland at the angle of the right jaw became acutely inflamed and tender to palpation. X-ray treatments were again resorted to for treatment of both regions and the process

Fig. 5 (McKenzie). The eyelids as they appeared on October 14, 1938, approximately one year after beginning X-ray therapy.

appears to be abating (fig. 5). Recent medical check-up has failed to locate any lesions elsewhere.

Prognosis as to life is, of course, poor. The patient was advised to continue pres-

ent treatment and to return weekly for observation.

The author wishes to express appreciation to Dr. Harvey D. Lamb for his cooperation in preparing this report and for the excellent photomicrographs.

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RADIUM IN THE TREATMENT OF CHALAZION

GEORGIANA DVORAK-THEOBALD
Oak Park, Illinois
AND
CLEVELAND J. WHITE
Chicago

The application of irradiation to the treatment of infections and inflammatory conditions dates from shortly after the discovery of the roentgen rays. But, although proved to be of very great benefit and almost specific in a number of such conditions, its use by the general profession in inflammations of an infectious origin has been very limited, due partly to failure of practitioners fully to appreciate the benefits, partly to the failure of radiotherapeutists to develop precise techniques for certain definite local lesions, and partly to lack of complete coöperation between practitioner and radiologist. This applies to the use of both roentgen rays and radium.

Irradiation treatment of tumors, especially malignant tumors, has been greatly developed and extensively applied. We must, however, keep in mind that the objective aimed at in irradiation therapy of inflammatory conditions is quite different from that in the treatment of a tumor or malignant condition. In the latter the aim must be to deliver the largest possible dose to every part of the tumor compatible with preservation of the integrity of the overlying and surrounding tissues. Massive dosage is the rule. In inflammatory conditions the beneficial effects of irradiation, as stated by Hodges and Berger, are not due to any subversive action on pathogenic agents, but are apparently based on the sensitivity of leucocytes, as well as perhaps the liberation and stimulation of antibodies, ferments, or substances inimical to the infecting agents or which effect metabolic changes in the cells. In inflammations the object of irradiation is not to destroy tissues. In a recent lecture Richard A. Jaffé said, "Weak doses of irradiation seem to stimulate the reticuloendothelial cells; several authors, among them W. Soper (Zeit. f. exper. Path. u. Therap., 1917, v. 16, p. 467) have stated that radiation intensifies vital staining, which may be considered as the morphological expression of an increased functional activity."

On the part of practitioners, misconceptions have arisen from attributing the effects of massive dosage on tissues as also desirable in the case of the small dosage used in the treatment of inflammations. The occasional secondary effects of irradiation of malignant or deep-seated tumors cannot perhaps be avoided; but this does not apply to superficial infections treated by very moderate irradiation therapy. The doses employed for obtaining the subsidence of inflammations are less than the erythema dose and the risk of injury to healthy tissues is minimized; there is no need to use massive doses and, indeed, as Desjardins remarks, the risk of complicating the inflammation already existing by inducing an inflammatory reaction to an excessive dose of rays, may spread rather than resolve the primary inflammation.

While the primary object of this paper is to point out the advantage of radium in the treatment of chalazion, it will not be amiss to refer briefly to some of the applications of radium therapy to other ocular lesions.

Radium in opthalmology

The application of radium therapy in ocular pathologic conditions, both benign and malignant, is governed by the same general rules as its application elsewhere. As Ward pertinently remarks, the proper appreciation of the radiosensitivity of the various parts of the eye has a most important bearing on the value of this therapy. Radium gives off three kinds of energy: the alpha, beta, and the gamma rays, which produce a caustic effect, tissue changes, and growth restriction. According to Clement, radioresistant growths have a definite plan of growth—marked production of fibrous tissue, scant but well-defined blood supply, and a compact cell of adult type with low metabolism. The radiosensitive growth has a loose cell structure, delicate blood supply, paucity of fibrous tissue, and no definite plan of growth. The penetrating gamma ray, according to Brown and other writers, is more suitable for deep-seated lesions and the softer beta rays for superficial lesions. These beta rays, applied at short intervals for short periods, seem to be effective in the treatment of inflammations and when properly applied are relatively harmless to tissues. It is rather a matter of radiologic technique to exclude undesired emanations by proper screening and filtration. The ideal to be aimed at in ocular radium therapy is the correct appreciation of the difference in sensitivity between diseased and normal tissues; when this is reached the diseased tissue is destroyed and the surrounding tissue but little affected.

Literature

Ward states that of the ocular structures the conjunctiva and lids are the most susceptible to radium emanation, the globe, excepting the lens, being comparatively radioresistant. Among the benign lid lesions very susceptible to radium are nevi and papillomas. Epithelioma of the lids often yields to radium therapy. Creeves states that he had two cases of lid epithelioma which disappeared like magic under radium treatment, and Hubin, of Weeker's Ophthalmic Clinic, in the University of Liège, states that epithelioma of the lids has been treated there by radium regularly since 1925, and that between 1925 and 1931, 36 cases had been completely cured, with results superior to those from any other form of treatment.

There are several reports in the literature concerning the radium treatment of intraocular tumors, but in this paper our interest lies elsewhere.

With regard to irradiation therapy of ocular inflammations, Desjardins, of the Mayo Clinic, states that certain inflammatory conditions of the eye can be treated effectively with radium or with roentgen rays.

As previously stated, in this paper we desire particularly to deal with the radium treatment of chalazion.

The term chalazion is often loosely applied to any swelling, whether inflammatory or not, either in a meibomian gland or its duct, and Knapp states that under the diagnosis of chalazion, tumors of the eyelid are operated upon which are not chalazia but often epitheliomas. The chalazion is a benign growth.

True chalazia may be divided into three groups: those in which the center is liquid and the walls well defined. This type usually yields readily to surgical opening and curetting. In the second group the center is partially liquid but there is also soft granulation tissue. Chalazia of this kind are often spoken of as retention cysts, but they cannot be classed as cysts because the contents are not the product of glandular activity, as in the case of a true cyst, but are the result of necrotic changes. Moreover, the wall of a chala-

zion is not a true capsule possessing an epithelial lining, but is formed by a condensation of the connective tissue in juxtaposition with the growth.

The third type of chalazion is composed of firm granulation tissue, and the surrounding lid is thick and boggy. Histologic examination shows that in this type the granulations extend into the surrounding tissues without a definite confining connective-tissue boundary. Even careful surgery may not be successful in reaching all the granulations, and the tumefaction may recur.

In a review of the pathogenesis and pathologic anatomy of chalazion, published in November, 1935, one of us (G. D.-T.) reached the conclusion that, despite the very large amount of histologic investigation of this little tumor of the lid, there was still indecision as to its exact nature. The now clearly established chalazion may be defined as a circumscribed elevated mass of inflammatory granulomatous tissue, generally containing giant cells, situated in the tarsus, resulting from a chronic inflammatory process. It is properly a granuloma, the term being justified by the histologic elements usually constituting the growth. The present accepted view is that it originates from a low-grade infection involving a meibomian gland with blocking of its excretory duct. There are, however, other theories which need not be discussed here.

No matter what may be the nature of pathogenesis of chalazia, their histologic structure shows that these growths are particularly radiosensitive; they fulfill the criteria of Clement, already mentioned, in that they are of loose cell structure, with delicate blood supply, scant fibrous tissue, and without any definite plan of growth. Under the action of radium or of roentgen rays the superabundant cellular tissue forming the tumorous mass gradually regresses and disappears within a few weeks, leaving only a small, soft, pliable scar. The biologic action of irradiation on the inflammatory process has already been discussed.

In the general literature we find no mention of the radium treatment of chalazia. Hodges and Berger state that granuloma in general responds favorably to irradiation. Brown, who reported on 258 ocular lesions covering 35 different diseases treated by radium, does not mention chalazion.

The cystic types of chalazion usually are amenable to surgical curetting; in the type of chalazion composed of firm granulation tissue in a thick boggy lid, radium therapy is particularly useful and effective. We have had experience with several cases of this kind in which radium therapy yielded very satisfactory results. The following case is typical.

Case report

Miss M., aged 44 years, came to my (G. D.-T.) office, June, 1934, with the history of recurring chalazion in her left lower lid. The nasal side of the lid was very thick; on everting it, a large granulating mass was seen just posterior to the lacrimal duct. The mass had been opened and curetted twice previously and, on account of its position, I hesitated to proceed with radical surgery, fearing a deformity of the lacrimal apparatus.

Under local anesthesia I removed most of the granulation tissue and referred the patient to Dr. Cleveland White for radium treatment.

Following the excellent result obtained in this case, all other cases of chalazion, suitable for radium treatment, that came to my observation were referred to Dr. White. The treatment was tried at first on recurring chalazia only, but later, on all chalazia of the granulation type, even those incised and curetted for the first

time. In three cases the chalazia were treated by radium without a preliminary curetting. In all cases the patients when first seen showed an inflammatory reaction, a thickened boggy condition of the tissues around the chalazion which suggested a sluggish rather than an acute inflammation. In all cases the chalazion itself was composed of gelatinous granulation tissue.

Altogether 28 patients have been treated. In all except the three that did not have a preliminary incision and curetting, the results were excellent and no recurrences have been observed.

Dr. White's report is as follows:

"The radium treatment of chalazion was suggested by Dr. Theobald. All the patients when first seen had the characteristic chalazion nodule complicated by inflammatory swelling and boggy thickening of the tissues surrounding the lesion.

"The pathology and ophthalmologic handling has been discussed by Dr. Theobald.

"As there were no known criteria on which to base radium treatment, it was carried out along emprical lines at first. Eventually the following technique was worked out: The chalazion was well isolated and lead screens placed around it. A 10-mg. plaque of radium was used, filtered by one-tenth millimeter of aluminum. Four treatments of 18 minutes each were administered, and the treatments were given twice a week.

"Twenty-eight patients were treated, and of this number 23 showed marked response after the third treatment. Two failed to take more than two treatments. Of those that completed the course three apparently did not get what might be called an excellent result. These three patients had had no curetting preceding the radium treatment.

"It is felt that with increasing experience larger doses of radium may be given. Possibly it would be well to use more filtration with the increasingly larger doses. The results are more spectacular where there is marked inflammatory swelling of the surrounding tissues."

Discussion

We have reported these cases because, although in the majority of chalazia, surgical treatment is practical and effective, yet there are others in which surgery is difficult or leaves an unsightly scar. Moreover, in cases of recurring chalazion of the granulation type, ordinary methods fail often to prevent recurrences, as in the aforementioned case. For all such eventualities radium therapy is suggested.

It may be objected that radium treatment of chalazion exposes the patient to serious risks, especially that of radium cataract. In the literature, there are reports by Blegvad, Gualdi, de Schweinitz, Merkulov, Moore, and others of cataract appearing within two years following the application of radium in the treatment of ocular lesions. It should be pointed out, however, that in almost all cases cataract followed radiotherapy of deep intraorbital tumors or superficial malignant tumors in which massive dosage was employed. In the case of superficial benign ocular growths, such as chalazion, only light dosage, less than erythema dosage, is sufficient, and proper screens and filters amply protect the lens and globe from any possible damage. The worst that may be anticipated in the radium treatment of chalazion by a competent radiotherapeutist is a conjunctivitis of a temporary nature.

Blegvad mentions a possible slight complication from irradiation about the lids not previously described. This consists of an overlapping of the skin over the mucosal lid margin or vice versa. Blegvad explains this by a difference in the

radiosensitivity of the epidermis and mucous membrane; the epidermis, being less sensitive, heals faster and extends over the slower healing mucous membrane. Such a complication was not observed in any of our cases.

Summary

The application of irradiation therapy to infections and inflammations generally is discussed.

The value of radium in the treatment of granulomatous chalazia is pointed out and illustrated by case reports.

The application of the radium is described.

715 Lake Street.

122 South Michigan Avenue.

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ESSENTIAL PROGRESSIVE ATROPHY OF THE IRIS

M. HAYWARD POST, M.D.
Saint Louis

Essential progressive atrophy of the iris is a rare disease of unknown etiology. In a recent paper Max Fine and Hans Barkan[1] report that they were able to assemble from the literature only 23 cases belonging to this clinical entity. It seems desirable, therefore, to call attention to another of these comparatively rare cases. The present status of our knowledge concerning this disease has been well summarized in a recent paper by Dr. Hugh S. McKeown,[2] presenting some beautiful colored plates illustrating the progress of his case, and including two gonioscopic views, showing adhesions of the root of the iris to the posterior surface of the cornea. Such adhesions have been demonstrated in a few pathological studies, but never previously by gonioscopy. An examination with the gonioscope was made in the case herewith reported and similar adhesions were noted.

In defining the condition, Fuchs[3] states that certain similar types should be excluded. These are those resulting from "(1) long-continued or recurring inflammation, (2) increase of tension involving the blood vessels at the root of the iris, (3) traction on the iris, or iridodialysis, (4) too thorough absorption of swelling lenticular material, and (5) advanced age, or an unrecognizable cause." In addition, it is obvious, owing to its progressive nature, that congenital anomalies should also be omitted.

The typical history in these cases is about as follows:

The first abnormality noticed has been an eccentric position of the pupil, usually involving the iris stroma to a greater degree than the pigment layer. Gradually the displacement of the pupil increases, and presently an iridodialysis appears, as a rule in that portion of the iris attenuated by the stretching which results from the eccentricity of the pupil. This iridodialysis is eventually followed by others, usually through much of the iris structure. In a few cases, the entire iris has disappeared. In the meantime, increased intraocular tension has supervened in all but one case reported, accompanied by the usual attendant loss of vision and occasionally by sensations of pain. In many of the cases thus far reported, it has been this latter symptom that has first caused the patient to seek relief. For many years, indeed, there was considerable discussion as to whether the disease originated with the iris atrophy or with increased intraocular tension. Once established, the progress is ultimately toward complete loss of vision. Operative procedures in most cases have been unsatisfactory, relieving the tension only for a short time, or not at all. Stieren[4] reported one case in discussion, relieved permanently by trephine operation. Ophthalmoscopic studies have revealed the gradual onset of the usual glaucomatous changes in the retina and disc. Pathological examinations by Feingold[5] and Wood[6] have shown in one or two cases an unusual atrophic condition of the optic nerve, due to the so-called cavernous degeneration of Schnabel. Furthermore, in Feingold's patient, peculiar degenerative ganglion cells were found lying in an area of the retina to the temporal side of the disc, in which the nerve-fiber layer was greatly thinned and the number of normal ganglion cells markedly reduced.

The chief discussion has risen as to

the etiology of this condition. As previously noted, there was for a time considerable doubt as to whether the iris atrophy or the increased intraocular tension was the primary lesion, but numerous cases have now been reported in which the atrophy of the iris was observed for varying periods of time before the onset of glaucoma. De Schweinitz[7] watched his patient for two years before increased tension was noted. Rochat and Mulder,[8] in their case, observed no signs of intraocular tension until the second examination, which took place seven years after the first observation. McKeown[2] has followed his case for four years without finding symptoms of glaucoma, the tension and the vision both remaining normal up to the present time. Waite[9] felt that intraocular hypertension supervened as a direct result of the reaction in the capillary bed, due to the atrophy of the iris. Feingold[5] and Lane[10] felt that a disturbance of circulation was the primary etiological factor. The former writer considered this to be congenital, the latter that it followed arteriosclerotic changes. Zentmayer[11] suggested malnutrition from vascular sclerosis, and de Schweinitz was of the opinion that some constitutional or focal infection might have resulted in disease of the vessels of the iris, thereby lowering nutrition and resulting in atrophy. Kreiker[12] suggests that possibly cytolytic processes which normally resorb the pupillary membrane during intrauterine life may become reactivated to the point of resorption of the normal iris tissues. This theory seems hardly tenable, owing to the rather advanced age of onset in a few of the cases. Deposits on Descemet's membrane, indicating a preceding iridocyclitis, were reported by Hess[13] and Harms,[14] two of the earliest writers on this subject. Such a finding would, however, according to the accepted definition, rule their cases out as true examples of essential atrophy of the iris and need not, therefore, be considered. In a few cases, antecedent injury has been noted, but hardly in sufficiently close relation to the initiation of the disease as to warrant considering it to be an etiological factor.

The onset has usually been in early adult life, though the youngest patient, that of Fine and Barkan,[1] was only five years old, and that of Griscom,[15] 54 years of age. Females have been affected twice as often as males, according to Fine and Barkan. The affection is, for the most part, unilateral. Only two or three bilateral cases have been reported. The general condition, as a rule, has been good. Luetic infection has apparently played no part.

Case report

Miss M. K. O., 35 years of age, was first examined on January 21, 1913, by Dr. M. Hayward Post, Sr. Since then, her case has been followed at frequent intervals up to the present time. The chief complaint, which had led her to seek advice, was headache, accompanied by blurring and drawing of the eyes after close work. Glasses had been prescribed by an optician six years previously, and changed four times during the interval, the last occasion being about one year before the date of the first examination. The vision, without correction, was then found to be, right eye 20/30, left, 20/15. Glasses were prescribed as follows: O.D. — 1.00 D. cyl. axis 180°; O.S. — 0.75 D. sph. ⊂ — 0.50 D. cyl. axis 90°. With them, the vision in the right eye was increased to 20/24, that in the left remaining as before.

It was noted that the right pupil was pear-shaped, with its narrow, elongated portion reaching almost to the limbus at the upper pole in the vertical meridian. In the upper temporal quadrant there was a complete perforation through the

root of the iris, roughly circular in shape, 2 mm. in diameter. There were several small perforations, and a general ragged condition of the iris stroma near the limbus at the lower pole, opposite the elongation noted above. The lower border of the pupil was, however, not displaced upward, nor was there any special pull on the fibers of the iris below (fig. 1). The tension in the right eye, as measured by the Schiötz tonometer, was 45 mm. Hg. No definite ophthalmoscopic findings were recorded at that time, but it was stated that after dilation of the pupils no cause for atrophy of the iris could be discovered. This statement, in accordance with the usual custom of the elder Dr. Post, was equivalent to a negative report as to the presence of demonstrable pathologic condition of the lens, fundus, or optic disc. The wording of this report would also exclude the presence of iridocyclitis, no symptoms of which have ever been demonstrated up to the present time. A chronic conjunctivitis was noted, and treatment with zinc sulphate and zinc oxide was instituted for that condition. Pilocarpine was also prescribed shortly afterward.

The tonometer readings continued to be elevated, and pain and discomfort were complained of at times. These latter symptoms were often of a sharp, shooting character and were greatly increased following close work. Fields for form, taken on April 15th, showed that of the right eye reduced to about one half the normal size, that of the left eye normal. By June 10th, tension was reduced to 40 mm. Hg, but pain continued as before. Pilocarpine was discontinued at this time and potassium iodide was substituted. A year later, on April 11, 1914, the pain had again recurred, and the tension was up around 50 mm. Hg. The field had shrunk to within the 10-degree limit, being especially contracted above. Eserine was used, and pilocarpine was again prescribed. The tension, nevertheless, continued high, and the pain was unrelieved, so that operation was recommended and was performed about May 1st, by Colonel R. H. Elliot during his visit to Saint Louis. The procedure selected was a typical Elliot trephining.

Despite a good edematous flap, and frequent instillations of eserine, the tension

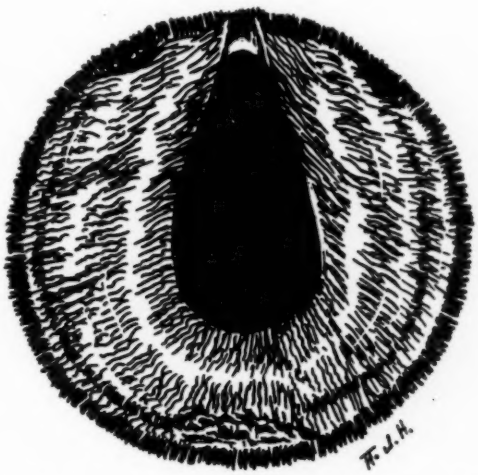

Fig. 1 (M. H. Post). Appearance of iris and pupil at first examination, January 21, 1913.

was little affected. On May 28th, the tension was 37 mm. Hg, and the vision was reduced to 20/120. The systolic blood pressure recorded at this time was 110 mm. Hg. During the next few months, the eye exhibited rapid fluctuations of tension. At one moment it would be somewhat soft, and an hour or so later the tension would rise to such an extent as to cause the cornea to become steamy. On November 27th, therefore, the eye was again trephined, a 2-mm. trephine being used. Following this operation, the tension remained normal, but the vision continued to fail. On February 2, 1915, it was reported as the ability to see hand movements at one foot. The optic disc was grayish white, sharply defined, and

showed four diopters of excavation. The vision in the left eye was noted as 20/12, without correction.

Since then, little change has taken place. On June 20, 1923, the cartilaginous septum of the nose was removed, and the sphenoid and ethmoid on the left side were opened. By April 17, 1934, the vision had fallen to zero. The tension, taken at that time, was O.D. 16 mm. Hg, O.S. 16 mm. Hg (Schiötz).

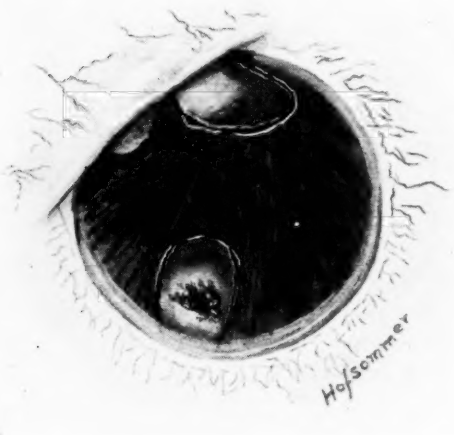

Fig. 2 (M. H. Post). Showing progressive iris atrophy. Appearance of iris and pupil in 1938.

This condition had not changed when last seen. Ophthalmoscopic examination gave only a good red reflex. The lens showed a moderate degree of nuclear and cortical cataract, sufficient, however, to prevent any view of the fundus details. It is interesting to note that in the left eye the lens is clear, the fundus and disc are well seen and show no abnormalities. The vessels are free from arteriosclerotic changes.

The iris appears as shown in figure 2. The pupil is drawn upward, so that its lower margin does not extend below the upper one fourth of the entire diameter of the cornea. Nor does it quite reach the limbus above. The upper nasal portion is covered by a heavy fold of conjunctiva which was brought down to cover the trephine opening. The pupil is somewhat elongated in the horizontal meridian, measuring about 6 mm. by 3 mm. There is marked ectropion uveae surrounding the entire opening. About the center of the conjunctival fold there is a rather well-marked and circumscribed bleb of conjunctiva. Below this bleb and somewhat to the temporal side, lying below the pupil and about one half its size, is an almost circular dialysis of the iris with some ectropion uveae, not so marked, however, as that about the pupil itself. At the lower pole, extending well out to the limbus, a third break through all the layers of the iris is present. This opening is about the same size as the pupil, but having its greatest diameter in the vertical meridian. Marked ectropion uveae is present. In addition, there is a delicate, brownish pigment deposit on the anterior lens capsule, somewhat accentuated by the slightly grayish appearance of the lens. A fourth rather small dialysis, extending through the entire iris tissue, can be seen above the temporal portion of the pupil. The stroma is greatly attenuated throughout and shows marked atrophy. In many places, the pigment layer of the iris is seen, the color being of a rather greenish cast. Many of the fibers have been drawn out from their lower ciliary attachment to at least twice their normal length.

Gonioscopic examination did not show the brown band of the ciliary body. The canal of Schlemm could not be made out. Below, to the temporal side, a few fibers of the iris stroma were adherent to the endothelial surface of the cornea. A similar adhesion was seen above and to the nasal side. Neither the dialysis below nor that to the nasal side extends completely out to the root of the iris. The ciliary processes cannot be seen at either place.

Conclusions

This case is of interest because of the long period over which it has been observed, rather than for any particular additional information that it gives as to the etiology of this condition. The recorded data are insufficient to determine whether or not arteriosclerotic changes preceded the iridodialysis. It would appear that stretching of the iris tissues played little part in the etiology, as these were not seen to be under tension when first observed. The only evidence of any inflammatory process having existed at any time was the presence of a few pigmented spots on the anterior capsule of the lens, seen through the dialysis in the iris below. These might possibly be interpreted to indicate a very low-grade inflammation involving the pigment layer of the iris at this point.

524 Metropolitan Building.

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CONGENITAL PREPAPILLARY CYST CONTAINING A MOVING VASCULAR LOOP

JESSE M. LEVITT, M.D., AND RALPH I. LLOYD, M.D.
Brooklyn, New York

Case report. B. S., aged 15 years, a school girl, came to Dr. Levitt on May 29, 1938, because she had been told by the school physician that there was something wrong with the left eye. Her eyes had never bothered her, nor had she had any serious illness. The visual acuity of each eye was 20/20 and both were outwardly normal in every way. The vision of each eye under homatropine cycloplegia was 20/40 corrected with —0.50 D. sph. to 20/20.

The media and fundi of the right eye were entirely normal. The media of the left eye were clear, but in the fundus was a striking abnormality. A grayish-white circular elevation covered part of the disc (fig. 1) and extended beyond it at the lower inner margin. It was about 2½ to 3 times the disc size and surrounded by normal tissue everywhere. The elevated area was rather sharply demarcated over most of its extent by a light reflex located farther out than the ophthalmoscopic image would suggest it should be. The retinal vessels at the lower part passed in front of it; those at the upper part were veiled and ensheathed in the tissue covering. There were no pigmentary deposits nor was there any other evidence of possible inflammatory or hemorrhagic disturbance. In making an observation with the monocular ophthalmoscope the involved zone appeared elevated above the rest of the fundus. The true nature of the cyst was disclosed only when studied with the Gullstrand binocular ophthalmoscope; its cystlike character was not otherwise apparent. In addition a loop (fig. 2) was seen within, moving up and down behind the retinal blood vessels with every motion of the eye. This loop moved above beyond the upper limit of the disc and below to the lower disc margin when it descended. The loop remained above (erect image) when the eye was at rest, suggesting that the loop was lighter than the media in which it moved. The upper end of the loop assumed a knobbed appearance, evidently due to its being observed from the front with one arm of the loop placed behind the other. The attachment and origin of the loop could not be seen because of the density of the tissue over the disc at this point.

The blind spot of the left eye was moderately enlarged with sharp limitations, as the illustration shows (fig. 3) and is about what one would expect, assuming that the optic-nerve fibers pass over the cyst in the anterior wall without being damaged. With red-free light, the binocular scope showed the nerve fibers running across the front of the cyst without apparent interruption or evident displacement, which would explain the absence of a wedge-shaped defect with the apex at the blind spot, which might be expected if the defect affected the nerve fibers running over this area on their respective routes to the periphery and intermediate points. The peripheral field of this eye was about ten degrees less than its fellow (fig. 4). This condition was plainly neither an inflammation nor a degeneration. The normal vision, absence of inflammatory deposits and pigment changes, sharp limitation of the defect and its cystlike character, connected with the disc, stamped it a malformation of a type not frequently reported but well understood.

Literature. A very few simple cysts like this have been reported, but the larger cystic dilatation of Cloquet's canal, pro-

jecting into the vitreous have been noted much oftener, and the very large type connected with the disc at the rear and reaching forward almost to the lens, with a dilated cystic anterior and posterior extremity is even more common. None of these occur with the frequency of the hyaloid-artery remnant of modest proportions throughout but easily seen and usually connected with the lens in front and the disc behind. The freely moving loop within the cyst was at first thought bizarre, but it is very similar to the preretinal vascular loops described first by Liebreich in 1871. According to Ida Mann these are persistent vascular loops in the glial tissue which project from the disc of the embryo with the hyaloid-artery stem as the axis. Usually, the vascular loop, the glial tissue, and the hyaloid artery all disappear, but if the loop persists and the other two elements disappear, a loop carrying blood may project out into the vitreous (fig. 5). The glial tissue may persist in varying degrees to explain the numerous forms of prepapillary tissue beginning with wisps of delicate tissue often seen on the disc, as

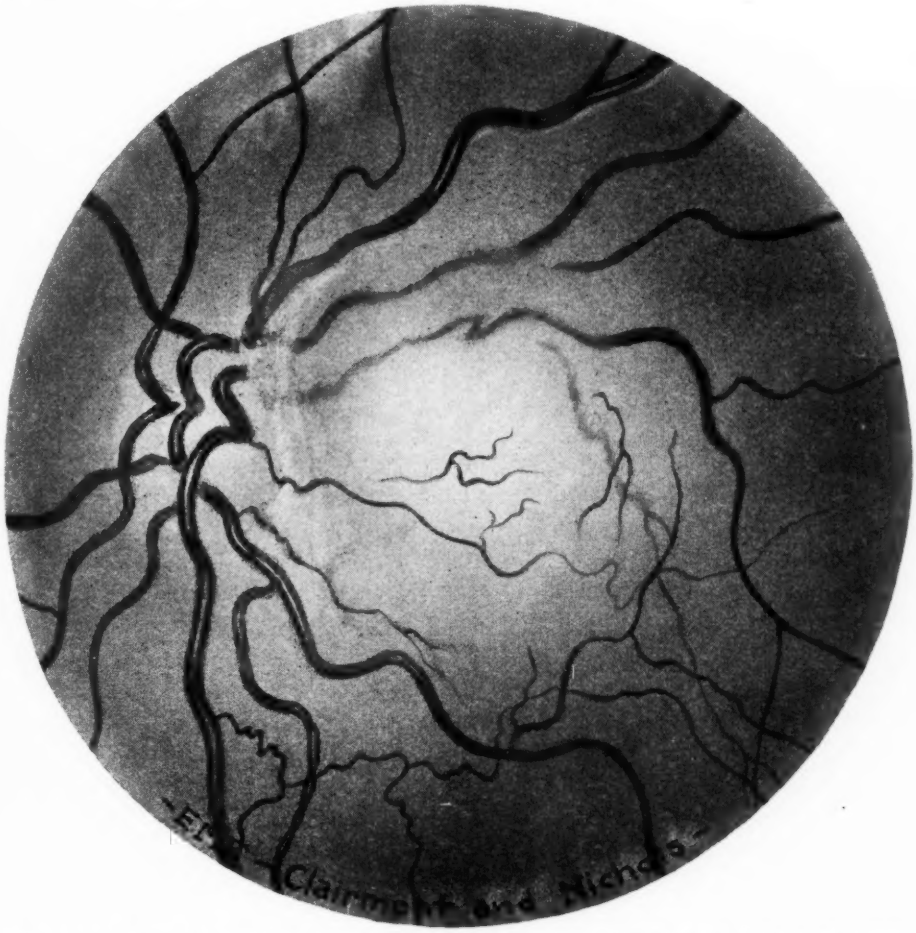

Fig. 1 (Levitt and Lloyd). Congenital prepapillary cyst as seen with hand ophthalmoscope. Vision = 20/20.

one extreme, and the congenital falciform detachment of the retina as the other, while a large patch of tissue plastered upon the disc, completely obscuring its details, may be considered as an intermediate form.

Reports of cystic formations in the glial tissue upon the optic disc are not numerous and none has been studied microscopically so far as we can learn. The flat variety such as the one we are reporting is by far the scarcest of the three varieties mentioned. In none of the reported cases have we been able to find mention of a vascular loop floating within, but this is not to be wondered at when it is stated that the loop could not be seen with the hand ophthalmoscope but was discovered and easily studied with the Gullstrand binocular ophthalmoscope. It seems reasonable to say that the loop is similar to those reported as projecting into the vitreous and that this one would have done so but for the persisting glial tissue distended by fluid, in front of it.

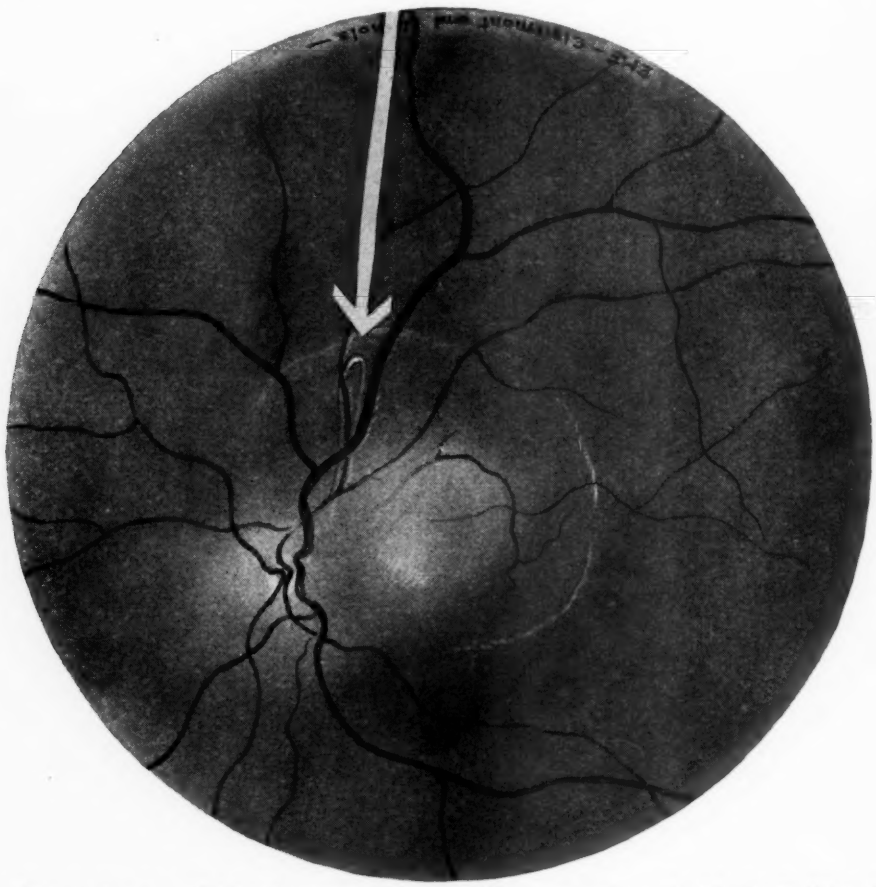

Fig. 2 (Levitt and Lloyd). Congenital prepapillary cyst observed with the Gullstrand binocular ophthalmoscope. The loop floating within the cyst comes to rest at the top and is just beneath the point of the arrow.

The illustration shows the embryonic tissue on the fetal disc, and the level to which the physiological atrophy progresses normally (fig. 6) can easily be seen.

The illustration by Miss Freret is very well done but it is impossible to reproduce the stereoscopic effect of binocular ophthalmoscopy. In the drawing, the loop does not assume the relationship to the other elements of the fundus which only the third dimension makes apparent when observed binocularly under high magnification. The movement of the loop was free and extended from the lower edge of the disc up to the position it occupies in the drawing. There might have been some doubt about its position from front to back, if it had been stationary, but the loop was always behind the retinal vessels as it moved, and the only incongruous feature was the apparent absence of any space between the retina and the tissue behind it above the upper border of the disc. In the other developmental defects like coloboma of the choroid, and the extrapapillary coloboma of Lindsay Johnson, and in pathological conditions like tuberculoma of the choroid, the scotoma resulting is often much wider than the defect seems to justify. The vessels of the retina are intimately associated with the anterior cyst wall and this agrees with the observations of the various types of defects of this group, including the so-called preretinal veils as described by Mann and Weve.

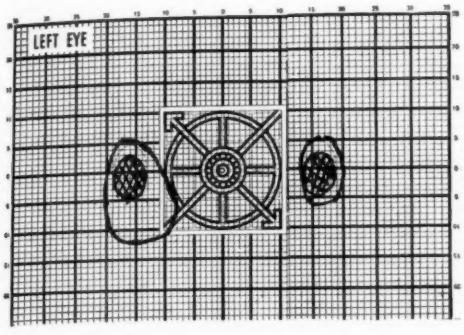

Fig. 3 (Levitt and Lloyd). Left eye. Blind spots mapped, using ½° white test object.

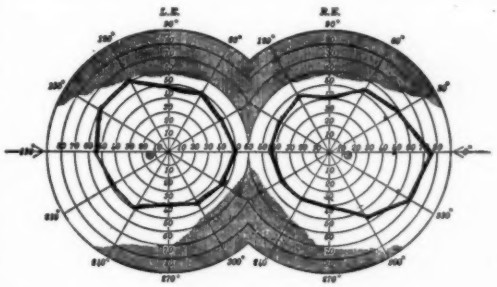

Fig. 4 (Levitt and Lloyd). Fields of vision taken with a 5-mm. white test object.

We have been able to find but one of these simple cysts reported in the litera-

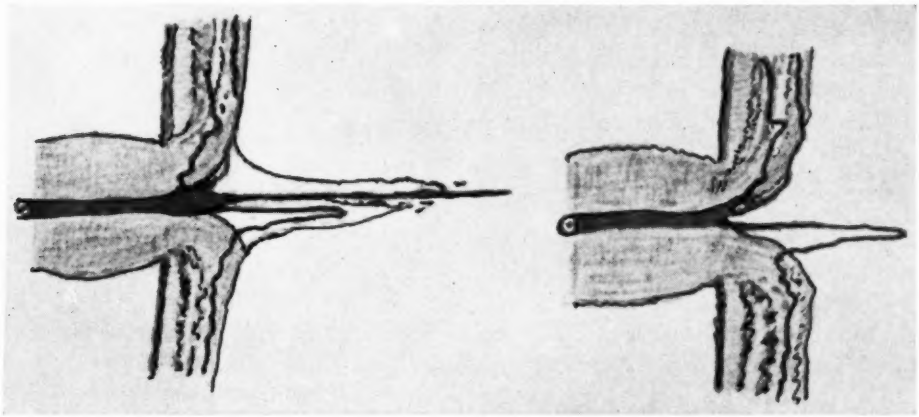

Fig. 5 (Levitt and Lloyd). From "Developmental abnormalities of the eye," by Ida Mann. (Cambridge University Press) Published in U.S.A. by The Macmillan Company. Used by permission.

ture and this is described by Yudkin (Archives of Ophthalmology, 1926, volume 55, page 364). Most of the cysts attached to the disc or its vicinity are dilated canals of Cloquet and usually have a dilatation at either end with a tube of lesser caliber connecting them like a dumbbell. Of those reported, that by Hunter Scarlett (this Journal, 1922, volume 5, page 941), is reproduced (fig. 7) through his courtesy, as it seems reasonable to assume that our case represents the first stage of the process leading up to this more pronounced defect.

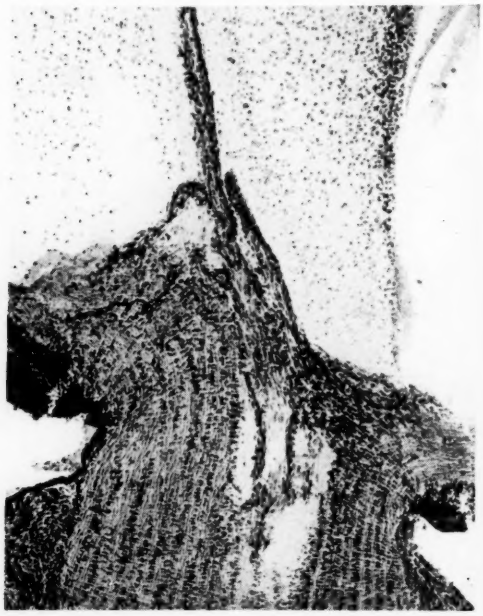

Fig. 6 (Levitt and Lloyd). Bergmeister's papilla. Fetal eye of about 4 months. Preparation from the collection of Dr. Brittain Payne. The hyaloid artery projects into the vitreous and the vascular loops, always present in the embryonic tissue, are seen in cross section. The line to which the fetal tissue will disappear, can be easily made out.

The various students of embryology agree that these cysts are formed in tissue of ectodermal origin entering the eye along with the blood vessels and found in fetal life on the disc sheathing the hyaloid artery and unnamed vascular loops, bearing the name of Bergmeister's papilla.

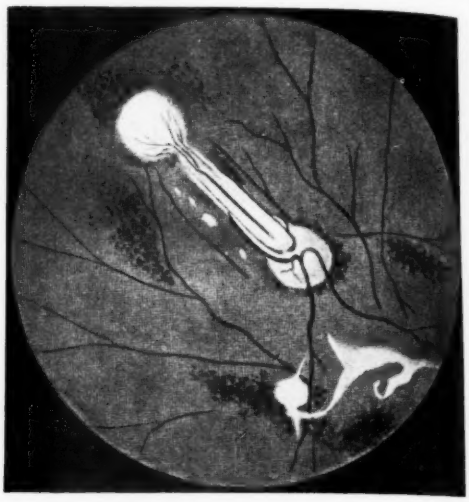

Fig. 7 (Levitt and Lloyd). From Hunter Scarlett's colored reproduction: Opaque canal of Cloquet with persistent hyaloid artery (Amer. Jour. Ophth., 1922, v. 5, facing p. 941; used by permission.)

SENILE CATARACT: THE USUAL METHOD OF OPERATING IN INDIA*

A REVIEW OF THE INDIAN LITERATURE ON SENILE CATARACT FOR 29 YEARS INCLUDING THE AUTHOR'S EXPERIENCE

W. A. FISHER, M.D., F.A.C.S.
Chicago

So much has been written describing the different methods of operating on senile cataract, that it has been suggested some surgeon operate on one hundred senile cataracts by the capsulotomy method, one hundred by the Smith intracapsular method, one hundred by the Barraquer method, and one hundred by the blunt forceps method.

To find a surgeon equally skillful in all four methods would be difficult, and his conclusions might be misleading. My belief that I can come as near at this time to making an unbiased report as I could by waiting for more experience is my excuse for offering this report. To give a wholesale report of the operation of senile cataract one must consult the Indian literature. My report will consist largely of what is found in Indian literature, togethor with some personal experience.

The Bombay Medical Congress in 1909 was divided into sections and was conducted in the same manner as the annual meetings of the American Medical Association, and the intracapsular operation for senile cataract was the topic of the Ophthalmological section.

At the time of this meeting there were two schools of thought regarding the operation of senile cataract, one headed by Colonel Henry Smith and his followers, advocating the intracapsular operation; the other headed by Professor Maynard of Calcutta, Professor Elliot of Madras, and Professor Herbert of Bombay, representing the capsulotomy method.

The meeting seemed to be one-sided, and all the senile-cataract papers were discussions of the intracapsular operation by the Smith method, and practically all who read papers dealing with senile cataract had received their instructions from Colonel Smith.

There did not appear to be any opposition at the meeting to Smith's method of operation, and one would naturaly suppose, after reading the papers of the eye section, that Smith's method would be followed by all ophthalmic surgeons, but Smith probably overstressed the fact that his specially trained assistant was indispensable. Naturally, a good assistant is an asset, but he or she is also an asset in the capsulotomy operation as well as in the intracapsular. Two nurses can be made good assistants in a very short time by holding the eyelids open upon each other, using Fisher's lid hooks after instilling two or three drops of two-percent butyn in the eyes, and a similar amount three minutes thereafter.

I am in agreement with many good surgeons that the only way of obtaining the Smith technique is to go to Smith and receive his personal instruction. I held this opinion, and operated in his clinic at Amritsar, India, in 1913, when in four weeks I operated upon 568 eyes for senile cataract with Smith watching and coaching me.

At the first dressing of my first fifty cases there seemed to be far too many cases of prolapsed iris. When I told

* Read before the Chicago Ophthalmological Society, October 4, 1938.

Colonel Smith of this complication he simply said, "Your hand is too heavy," and added that I would notice fewer complications in my next fifty cases. He was right. My hand was too heavy at first, and when I loosened up a bit the iris prolapse was less frequent.

Smith (Indian Medical Gazette 1922 and Smith's book, "Treatment of Cataract," 1928, page 81) advised many operations upon the eyes of six-weeks-old kittens as the best method of obtaining skill in technique. Holland expressed the same view (Eye, Ear, Nose and Throat Monthly, January, 1925) and stated that if the student operated upon one hundred kittens (two hundred cataract operations) before operating on a human eye, he would get more satisfactory work in the Holland Clinic than by any other method.

The afore-mentioned meeting of the Bombay Medical Congress lasted three days, and the eye section had many interesting papers dealing with diseases, some of which are never seen in America and create no interest here. The papers upon cataract (Bombay Medical Congress, 1909) all concerned intracapsular operations:

No capsulotomy papers were contributed.

McKechnie stated in his paper that Smith adopted the intracapsular operation as a routine in 1899, and operated upon both eyes at the same sitting, and that he had performed 20,000 operations in that manner in 10 years. He stated that in his opinion 200 operations would give one a fair training, but who in America or Europe, or in any place except India, could hope for such extensive training?

Jamison began his cataract surgery in the Smith clinic and reported 260 operations with 1.5 percent iritis, and states that any good operator with a fair amount of work should have equally good results after he has mastered the Smith technique.

Gidney of Dhubri expressed the opinion that 100 operations amounted to practical experience.

Oxley believes the great advantage of the intracapsular method over the classical capsulotomy operation is the elimination of capsule tags left in the wound and the low percentage of iritis. His conclusions are: (1) the operation is safe for the average operator; (2) it eliminates iritis due to cortical and capsule remains; (3) eliminates incarceration of the iris; (4) corneal incision does not cause excessive astigmatism or liability of infection; (5) detachment of the retina he has not seen.

Mathra Das began his cataract surgery in 1903 by the capsulotomy method, performing 3 operations in 1903, 41 in 1905, 153 in 1906, and 317 in 1907. After visiting Colonel Smith the second time he operated upon 804 patients by the Smith method. (He has used Smith's method since that time.)

Elschnig of Prague, one of the foremost operators in Europe, stated that one should perform at least one hundred capsulotomy operations before attempting the intracapsular.

The average operator in America or Europe would consider himself an expert after performing one hundred cataract operations by any method, and after acquiring that experience would hardly think of making a change.

In "One thousand cataracts in six weeks," by H. T. Holland, Shikarpur, Sindh, India (Indian Medical Gazette, May, 1914) it is stated that he performed 95 percent of senile cataract operations within the capsule by the Smith method, and operates upon both eyes at the same sitting.

Dr. Holland stated that after an experience of 3,000 senile cataract oper-

ations the Smith method is his choice. He also states that one of the great advantages of the Smith method is the practice of the first dressing of the eye on the fifth day, and again on the seventh and eighth days, after which the patient is usually discharged. Holland decided that the increase in his cataract operations from 220 annually to 1,024 annually, which increase occurred within a five-year period, is sufficient proof to him that the results of the Smith method are satisfactory to those upon whom operations have been performed.

Dr. B. Baird of Gouda (Indian Medical Gazette, January, 1914) stated that he had not been fortunate enough to have seen Colonel Smith operate, but he had observed some of Smith's pupils and had read Smith's book. He believes that Smith's intracapsular operation offers the best results.

Smith, in his tour of the United States and Canada (Indian Medical Gazette, February, 1922) performed about 500 senile-cataract operations. He refused no one who had the slightest chance of improvement, and many patients stated that they had been refused operations by other doctors. He told his large audiences that he had no concealed tricks, and many who witnessed the operations thanked him for the opportunity of witnessing the operation of complicated cases. (Naturally by operating upon all persons regardless of complications his percentage of good results would not be increased.)

Capt. M. M. Cruickshank's article, "Complications in 1,322 consecutive intracapsular operations in the Holland Clinic in Shikarpur" (Indian Medical Gazette, 1923) is worth reading and rereading. It was my pleasure to be in the Shikarpur Clinic that season, and as there was no electricity in Shikarpur I had a hand power Barraquer machine made in Barcelona, and carried it to Shikarpur. The power was produced by turning the fly wheel by hand. The pump was of the same construction as the electric one used in Barcelona by Professor Barraquer. Dr. Cruickshank's article describes 18 operations that were performed by him, Dr. Holland, and myself. I explained Barraquer's technique as best I could after observing him perform twenty cataract operations in Barcelona.

Fifteen of the operations reported were not complicated, and the visual results were reported as very good, and in three cases the capsules were ruptured. There were no other complications in the three cases with ruptured capsules at the time of operation. In one of these no useful vision resulted, but no cause for visual loss was given. The other two ruptured capsules were reported as successful operations.

The machine refused to function after eighteen operations had been performed, and it could not be repaired in Shikarpur.

Capt. Cruickshank, Dr. Holland, and I were well pleased with the results of eighteen operations performed by us whose experience with that method was very limited.

The month I spent in Shikarpur in 1923 was one long to be remembered. Capt. Cruickshank, Dr. Holland, and I were so engrossed in our work, seeking certain results, that when the time came to depart my only regret was that I could not stay on to perform a few hundred more cataract operations. (I returned to Holland's clinic the following year.)

All methods of incisions were described at the Bombay meeting, but it is my opinion that any well-made incision, either with or without a conjunctival flap, with or without sutures, or one entirely in the cornea, will be good, provided the puncture and counterpuncture are made deep

enough, and the incision embraces nearly one half of the cornea. Such an incision will usually allow free passage of the lens.

There are only a few papers in the literature reporting the results of 1,000 or more cataract operations; however, it is interesting to know that most of the results of 1,000 or more operations recorded in this paper were performed within a period of six weeks.

The Jungle Hospital. In the Indian Medical Gazette (1924) there is a most unusual article entitled, "Notes on seventeen thousand capsulotomy operations," by James MacPheal, Bamdah.

The location of Bamdah Mission Hospital is in the Maughye District; the hospital is operated by the United Free Church of Scotland and is called a Jungle Hospital. The largest town or village is Bamdah, which has a population of four hundred. The hospital was begun in 1900, and an operating room was built in 1903.

In the first year 34 capsulotomy operations for senile cataract were performed; in 1921 the number had risen to 1,440.

The article states that 90 percent of the patients are farmers, that 95 percent of them are illiterate, and that sometimes as many as 50 of them are operated upon in this jungle clinic in one day.

Free operations are rarely performed at the Jungle Hospital, but if every patient would pay one rupee (33 cents in American money) that sum could pay expenses. The patients furnish the food, which is very cheap, and their friends are their nurses and attend to their wants. The cost of private rooms ranges from two anas, or four cents, to ten anas, or twenty cents a day.

MacPheal states that he operated upon 100 patients by the Smith method without having seen Smith or any of his pupils operate, and inasmuch as Smith stated that one must be instructed by him, MacPheal gave up the intracapsular operation. He states, however, "there is much good to be said about the Smith operation."

A paper by W. A. Fisher and H. T. Holland (Eye, Ear, Nose and Throat Monthly, January, 1925) was read before the Chicago Ophthalmological Society on November 17, 1924, reporting the results of 1,455 cataract operations performed in Dr. Holland's clinic in Shikarpur in six weeks, from January 1 to February 15, 1924. Dr. Holland stated that I was responsible for 868 of the operations, and that the largest number of cataracts operated upon in one of these days was 114, and on the following day 85. He also stated that all of the 199 eyes were operated upon by me.

This is not only the largest number of cataract operations performed by me in two succeeding days in the Holland clinic, but the largest number recorded in literature in any clinic.

In Dr. Holland's paper he refers to Dr. Parker's paper presented to the American Medical Association in 1921 reporting 1,421 cataract operations, and quotes Parker as being unable to give visual results in 152 of them, and that it would be much more definite to tabulate the results surgically, irrespective of the visual results obtained.

If visual results are impossible in large numbers in the United States where illiteracy is not found, how can operators in India, where illiteracy is as high in some places as 90 percent, be expected to furnish visual results?

Illiterate or educated, as the case may be, good results can be expected after an uncomplicated intracapsular operation, when the cornea is clear, the fundus normal, and the healing process free from inflammation.

Doctors Barraquer, Benedict, Davis, Elschnig, Fisher, Gailey, Gradle, Greene,

Knapp, Lancaster, McReynolds, Parker, Pratt, Safar, and many others have reported visual results, but when good visual results are obtained it only proves that the credit should be given to the operator rather than the method of operating.

For ten years before going to India, I operated by the classical capsulotomy method; then followed four seasons in India, where I was privileged to operate upon more than 2,000 eyes by the Smith intracapsular method.

I visited Colonel Smith in 1913, and for 15 years thereafter, in an active operative clinic and in private practice, the Smith intracapsular method was selected; after this for 10 years the fascinating method of Barraquer and the blunt capsule forceps were used.

The key to the whole operative subject is, in my opinion, ambidexterity. "Ambidexterity has no meaning in eye surgery for there is no advantage to be gained by it." (Quotations from Smith's book, "Treatment of cataract," 1928, page 81.)

Smith, Holland, and others who have had much experience, do not claim to be ambidextrous but use their best hand for the incision and delivery of the lens.

Intracapsular operators, using the suction, or Barraquer, method, or the blunt forceps, require a higher degree of ambidexterity than those using the Smith method, because in operating by the Barraquer or forceps method, pressure must be made with one hand and traction with the other.

The Smith operation is performed by making the incision on the right eye with the right hand, while standing behind the patient's head, and on the left eye with the right hand, standing on his left side, cutting up, if one is right handed, and just the reverse, if one is left handed. The cataract is removed by pressure, using one's best hand.

Beginners, there is no excuse for any doctor to class himself as a novice in cataract surgery, because operating upon the eyes of 100 six-weeks-old kittens (two hundred cataracts—Fisher's "Senile cataract," ed. 3, 1937) will give him a good practical technique, and he may then expect to be rewarded by good results. A similar technique could not be obtained by observing others for an extended period, and after that experience performing a few operations.

30 North Michigan Avenue.

NOTES, CASES, INSTRUMENTS

A CASE OF MYELOGENOUS LEUKEMIA WITH GLAUCOMA DUE TO HEMORRHAGE

J. Arthur Buchanan M.D.,
and Harry A. Ballweg M.D.
Brooklyn, New York

A large ocular hemorrhage with glaucoma in the course of myelogenous leukemia appears to be a rather uncommon clinical condition. Reports of such cases in the literature are rare. The authors have been unable to find any reference to this complication of leukemia in the Quarterly Cumulative Index for the past 10 years.

Ocular Findings

The usual ocular changes found in myelogenous leukemia occur in the retina, especially at the periphery of the fundus. The fundus is abnormally pale. The vessels are less clearly outlined than normally and hemorrhages may be found, usually close to the vessels. Exudates may also be seen lying close to the vessels. These commonly appear as white flecks with a red border, in most instances of small size, irregular in shape, and sometimes striated.[1, 2] They represent collections of leucocytes and degenerated nerve elements surrounded by traces of hemorrhage. Less common findings include the involvement of the optic nerve with blurring of the disc outline, or actual swelling. Retinal detachment, clouding of the lens, and hemorrhage into the vitreous have been described. Cabot has seen two cases of unilateral exophthalmos, probably due to leukemic infiltration or hemorrhage into the orbit.[3]

The importance of ophthalmoscopic examination is to be stressed, for typical changes in the fundus may be found before there is any dimness of vision. Disturbances of vision may occur early or late in the disease, and of course depend upon the location and extent of the ocular lesions.

The following case has many interesting phenomena. The patient was under observation for five years before leukemia developed.

Case Report

The patient, a 53-year-old, married, white woman, was first seen on December 6, 1927. The family history revealed that she had had a brother who had died at the age of 34 years from a carcinoma of unknown location. One sister had died in childbirth, another was living and had a peptic ulcer, and a third had a dermatological abnormality, similar to that of the patient, which we shall designate as hyperplastic keratosis of the skin. Her parents had both died from unknown causes when more than 80 years of age.

The chief complaint was pain on top of the head, back of the neck, and over the right ear. These pains had begun about four years previously, but had been very severe for the last three weeks. Several years before she had had a similar severe pain in the right side of her head and the next day had amblyopia of the right eye, which was said to have been due to hemorrhage in that eye. Normal vision was subsequently restored. Secondary complaints were nervousness, a feeling of shakiness, and occasional hot flashes. Her last menstrual period had been a year previously. She tired easily, and stated that she had always had a tendency to be "anemic." She had suffered for months from sudden blanching of the fingers on exposure to cold.

The systolic blood pressure was 140 mm. of mercury, the diastolic, 100 mm.

There were many keratic patches on the face and abdomen. These patches were brown in color, flat or slightly raised, and varied in size and shape. Some especially large ones were noted on the right side of the abdomen. The blood count was as given in table 1. The urinalysis showed normal findings throughout the whole period of observation. The Wassermann test was negative.

The patient was seen again on December 10, 1927. Little change was noted. The blood pressure was 160/110.

Another visit on January 3, 1928, failed to reveal any essential change.

Two weeks later, January 17, 1928, the patient complained of soreness of the mouth, gastric distress, nervousness, and tiredness. She had lost many of her skin lesions following X-ray therapy.

The further course of the condition was uneventful until the summer of 1931, when she complained of "seeing wheels." The description given by the patient is as follows: "I am seeing wheels, wheels, and more wheels. (Her diagram of it is shown in figure 1.) They are very bright and move very fast. Then after a time, 10 to 30 minutes, they go off into space gradually, and my vision is clear again. In the meantime I am practically blind. All I can see are those awful things, eyes open or closed." The patient stated that she had experienced these optical sensations from the age of 16 years until three years before (1928). During the summer of 1931, these sensations occurred almost daily, and were preceded by a feeling of exhaustion. In earlier years, the aftermath of such an experience was invariably a severe headache, but now the patient felt well after the episode. Some relief had been obtained with bile salts as a laxative.

On October 9, 1931, the blood pressure was 160/80. Many of the keratic patches had disappeared as a result of continued X-ray treatments, but there were still a few on the abdomen. The laboratory tests were negative.

The scotomata appeared less frequently while the patient took milk of magnesia and bile salts. However, she tired easily,

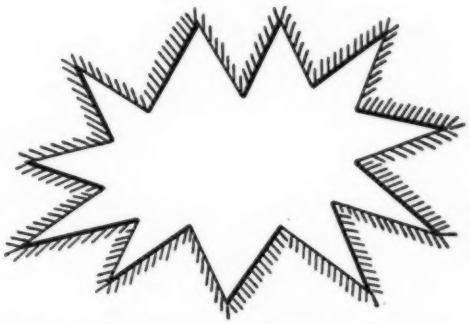

Fig. 1 (Buchanan and Ballweg). Diagram of transient scotoma.

and felt a weakness, most marked on the left side. She felt nervous and was emotional, stating that she had lost confidence in herself and was disposed to give herself up to crying spells.

Myelogenous leukemia found. On March 25, 1932, she reported that her left eye had bothered her, that vision was blurred in this eye, and that she had noticed a subconjunctival hemorrhage in the left eye. She admitted that she had, at times, noticed blind spots in her field of vision.

On examination, her vision was essentially the same as it had previously been, but she stated that objects appeared blurred. In the left eye, subconjunctival hemorrhages and a small hemorrhage into the iris were noted. The media were clear and the fundi were essentially normal. There was a pallor of the nail beds. The abdomen was tense and the edge of the spleen was palpable below the costal margin. Many keratic patches were seen on the body. The blood pressure was 178/98. A blood count was taken and repeated twice in the next three days, as shown in

table 1. On March 28, 1932, the spleen was felt to extend 11 centimeters below the costal margin, and was slightly tender.

A diagnosis of myelogenous leukemia was made and X-ray therapy was advised.

The patient, who had been seen frequently and examined carefully over a period of more than four years, developed myelogenous leukemia during an interval of five months.

Her general symptoms were lessened after radiation to the spleen and tibiae. The blurring of vision gradually decreased as the hemorrhages into the conjunctiva and iris were resorbed. The spleen became smaller, until on April 13, 1932, it was two centimeters below the costal margin and one week later, barely palpable. Table 1 shows the decrease in white cells.

In July, 1932, the leucocyte count began to rise and the spleen became larger and tender, despite continuance of radiation therapy. However, she felt fairly

TABLE 1

CHRONOLOGICAL LABORATORY DATA FROM A CASE OF MYELOGENOUS LEUKEMIA

Date	Red Blood Count	Hemoglobin	White Blood Count	Differential				
				Polymorphonuclears percent	Lymphocytes percent	Endotheliocytes percent	Myelocytes percent	Myeloblasts percent
12/ 8/27	3,880,000	85 (Dare) 80 (Newcomer)	6,400	73	16	11		
10/ 9/31	3,220,000	72 (Dare)	8,750	66	30	4		
3/25/32	3,640,000	74 (Dare)	112,050	32	17		51	
3/26/32		72 (Dare)	75,750	52	20		24	
3/28/32			91,400	34	18		48	
4/ 4/32		77 (Dare)	75,700	32	28		40	
4/13/32	3,700,000	71 (Dare)	67,500	41	22		37	
4/20/32	3,520,000	72 (Dare)	70,500	23	29	4	44	
5/ 4/32	3,800,000	76 (Dare)	58,100	26	28		46	
5/17/32	3,880,000	72 (Dare)	64,600	36	20		34	
6/ 1/32	3,720,000	76 (Dare)	82,850	34	26	1	39	
6/15/32	3,750,000	76 (Dare)	80,200	36	28		34	
6/29/32	3,530,000	74 (Dare)	84,900	23	18		59	
7/13/32	3,700,000	74 (Dare)	100,750	16	18		66	
9/14/32	3,550,000	74 (Dare)	101,850	18	24		58	
10/ 8/32	2,920,000	55 (Dare)	89,400	28	28		46	
10/14/32	3,030,000	60 (Dare)	142,950	22	18		57	3
10/24/32	3,170,000	67 (Dare)	132,200	25	26		49	
10/31/32	3,260,000	70 (Dare)	73,400	44	16		40	
11/ 9/32	3,430,000	70 (Dare)	22,100 21,850	26	26		46	
11/23/32	2,370,000	64 (Dare)	16,250	47	16		35	2
12/ 7/32	3,260,000	62 (Dare)	6,650	41	28		23	4
12/21/32	3,690,000	70 (Dare)	5,400	47	24		22	
1/ 4/33	4,090,000	78 (Dare)	17,600	56	36		8	
1/17/33	4,110,000	82 (Dare) 80 (Dare)	37,550	73	18		9	
2/ 3/33	3,630,000	72 (Dare)	68,600	70	10		18	2
2/15/33	4,140,000	78 (Dare)	32,350	53	9		38	
3/ 1/33	4,260,000	80 (Dare)	64,260	42	18		38	2
3/15/33	3,990,000	80 (Dare)	56,800	60	24		15	1
3/29/33	3,790,000	78 (Dare)	63,000	42	26	2	28	2
4/13/33	4,060,000	80 (Dare)	71,200	49	16	2	29	4
4/26/33	3,280,000	74 (Dare)	131,800	39	22		40	1
7/28/33	3,600,000	78 (Dare)	182,550	40	22		38	
9/ 6/33	2,860,000	62 (Dare)	236,200	36	20		44	

well and tired less readily than in the months before. Her left eye continued to improve objectively and subjectively, but not to normal limits.

In October, 1932, she began to feel worse, was weaker, and tired more readily. She looked pale and thin, having lost 15 lbs. in a month, from 168 on September 14th to 153 on October 8th. She complained of pain in the splenic area constantly. The blood pressure was 160/80. On October 14, 1932, Fowler's solution M viii t.i.d. was prescribed, as the patient refused further radiation therapy.

On October 30, 1932, another fairly large-sized subconjunctival hemorrhage occurred in the left eye, without further impairment of vision. The dose of Fowler's solution was increased to M x t.i.d. at this time, and to M xii t.i.d. on November 9, 1932.

On November 23, 1932, the patient called attention to the fact that she had developed many new skin lesions since taking Fowler's solution. Some of these lesions were flat and brown, and others were elevated, and had the general characteristics of verrucae vulgaris. The patient felt weak and was dyspneic. Ventriculin ʒ ii t.i.d was added as a therapeutic measure.

On December 7, 1932, the patient complained of numbness and deadness of hands and feet. The Fowler's solution was discontinued. Two weeks later, the numbness of the fingers was better. Many of the keratic patches had disappeared. The spleen was smaller and softer. The gait was seen to be slightly ataxic, and the patient thought her hearing was less acute. Edema of the legs developed, but the general condition remained about the same.

About January 20, 1933, the patient complained of loss of vision in the left eye and pain in the left eye, left cheek, and forehead. Upon external examination the conjunctiva of the left eye was found to be injected, and remnants of old subconjunctival hemorrhages were present; the pupil reacted sluggishly to light, and vision was the ability to perceive light but no images. Upon ophthalmoscopic examination, the fundus was not visualized, nor was a normal red reflex obtained. The anterior chamber, cornea, and lens were found to be clear. Transillumination of the eyes exhibited a difference between the two eyes in that the light obtained from the right eye was brighter than from the left. The intraocular tension was increased, and a diagnosis of glaucoma, associated with myelogenous leukemia, due to hemorrhage into the vitreous, was made. An X-ray study of the left eyeball gave no positive information. Decompression of the left eye relieved the symptoms of acute glaucoma, but vision was not restored, for the hemorrhage into the vitreous was not resorbed.

Following this episode, there was a remission, during which the patient looked and felt better. Many of the keratic patches disappeared. She was stronger, and her gait had improved. She spoke of a dull discomfort in the left eye, which appeared reddened. The cardiac symptoms of dyspnea and edema, which she had had, were relieved. However, during this time, the spleen enlarged continually and was quite hard. By April 26, 1933, the lower edge had reached the level of the umbilicus.

Despite the increasing leucocyte count there was no relapse until September, 1933, when she began to have hemorrhages into the muscles of the back, and had a daily febrile reaction. These hemorrhages formed masses about 8 cm. in diameter. They would gradually soften and fluctuate, and finally be absorbed, only to reappear. The fever of 100° to 103°F. continued. The spleen occupied

the entire left side of the abdomen, from the costal margin to the iliac crest. Vomiting and diarrhea began and extreme weakness ensued. All attempts to sustain life failed, and the patient died on September 26, 1933.

Comment

This case is interesting, not only as an example of a rare ocular complication of myelogenous leukemia, namely, acute hemorrhagic glaucoma with hemorrhage into the vitreous, but also because there are few data available concerning the interval of development of myelogenous leukemia. Here it developed in an interval of five months in a patient under observation for five years. The biological background of the family is suggestive that myelogenous leukemia may belong in the category of neoplastic diseases, as a brother had carcinoma, while the patient and a sister had multiple hyperplastic keratic patches of the skin. For years the patient had suffered from the local syncope stage of Raynaud's disease and the symptom complex designated migraine. She had had ocular hemorrhages years prior to the development of myelogenous leukemia.

510 Ocean Avenue.

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A CASE OF RECURRENCE OF OCULAR HYPERTENSION EIGHTEEN YEARS AFTER AN ELLIOT OPERATION

Mark J. Schoenberg, M.D.
New York

The importance of recording the course and evolution of a disease in the same patient over a period of many years has long been recognized by clinicians. Considering that glaucoma has always been regarded as a very perplexing problem, one would expect that careful records of minute details concerning glaucomatous patients, observed during the greatest part of their lifetime, would have been accumulated by now—ready for study and interpretation. A search of the literature on this subject reveals that there are no records of this kind. All we can find is that a number of papers have been published on late results obtained by the aid of certain operative methods for the treatment of primary glaucoma. These reports cover the impressive number of 2,263 operations. None of these papers gives a detailed account of the curves of ocular tension, of vision, of fields of vision, and changes as seen by the aid of biomicroscopy over a period of several years.

Gjessing[1] reports on two cases which were doing well four and six years, respectively, after operation, but the patients became blind four to five years later.

Dr. A. Knapp's[2] patient remained well for 11 years; then developed ocular hypertension on account of closure of the trephine opening.

Of Ploman's and Granström's[3] five patients, one remained well for 18 years and four for three, five, and eight years, respectively.

Gertrud Hausman[4] had one case of re-

currence of ocular hypertension 20 years after the operation and another patient remained well for 14 years.

Altogether we find in the literature reports of two cases in which recurrence of ocular hypertension took place 10 or more years after an operation.

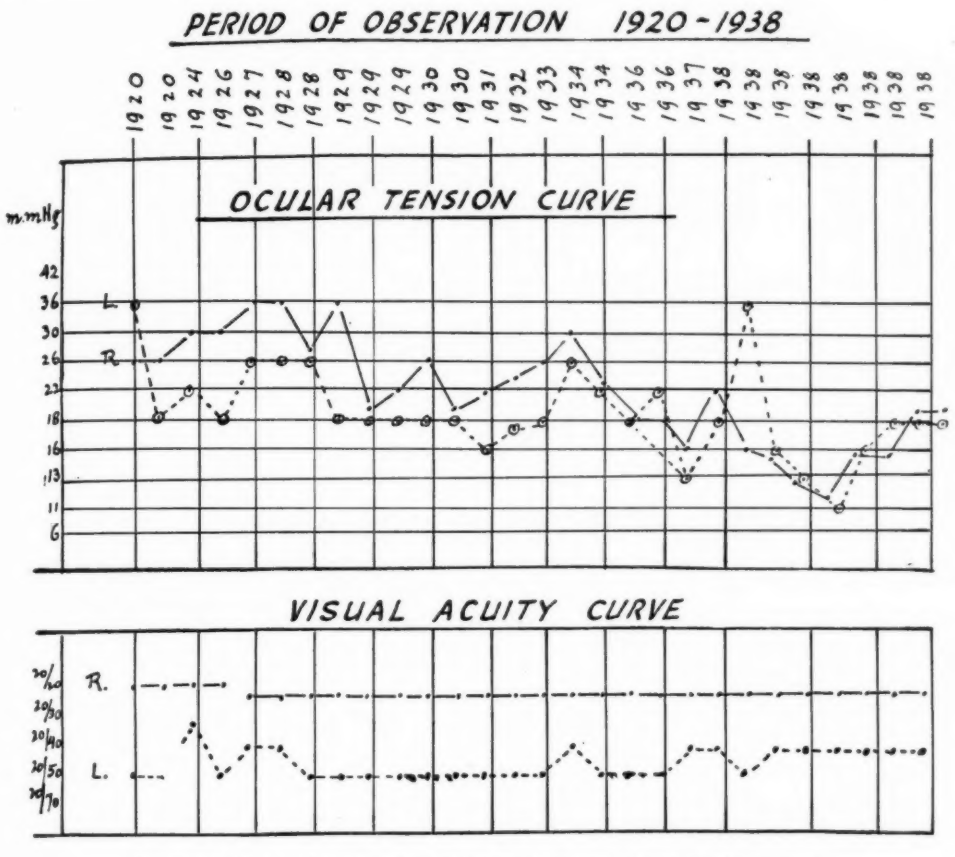

CHART 1 (Schoenberg). Intraocular-tension and visual acuity curves.

The case herein reported concerns a patient, S. N., who came under my observation 18 years ago. His age was 42 years; his occupation, that of a writer. He was nervous, easily excitable, and highly cultured. He complained that after an attack of influenza, three weeks previously, he began to have attacks of pain in his left eye, dimness of vision, and perception of rainbow circles around lights. A similar condition had developed three years previously, following a tonsillectomy. At that time, the eye cleared up without medical attention.

The examination revealed nothing abnormal in the right eye, but in the left eye the pupil was somewhat enlarged, and the tension, 35 mm. (Schiötz). Vision: R.E. with a +3.50 D. sph. ⌯ + 2.25 D. cyl. ax. 90°, was 20/30; L.E. with +3.00 D. sph. ⌯ +3.50 D. cyl. ax. 75°, was 20/200. Pilocarpine and eserine drops reduced the tension to normal. It remained at that level as long as the patient used the instillations regularly. However, since the patient was inclined to become careless with the use of the

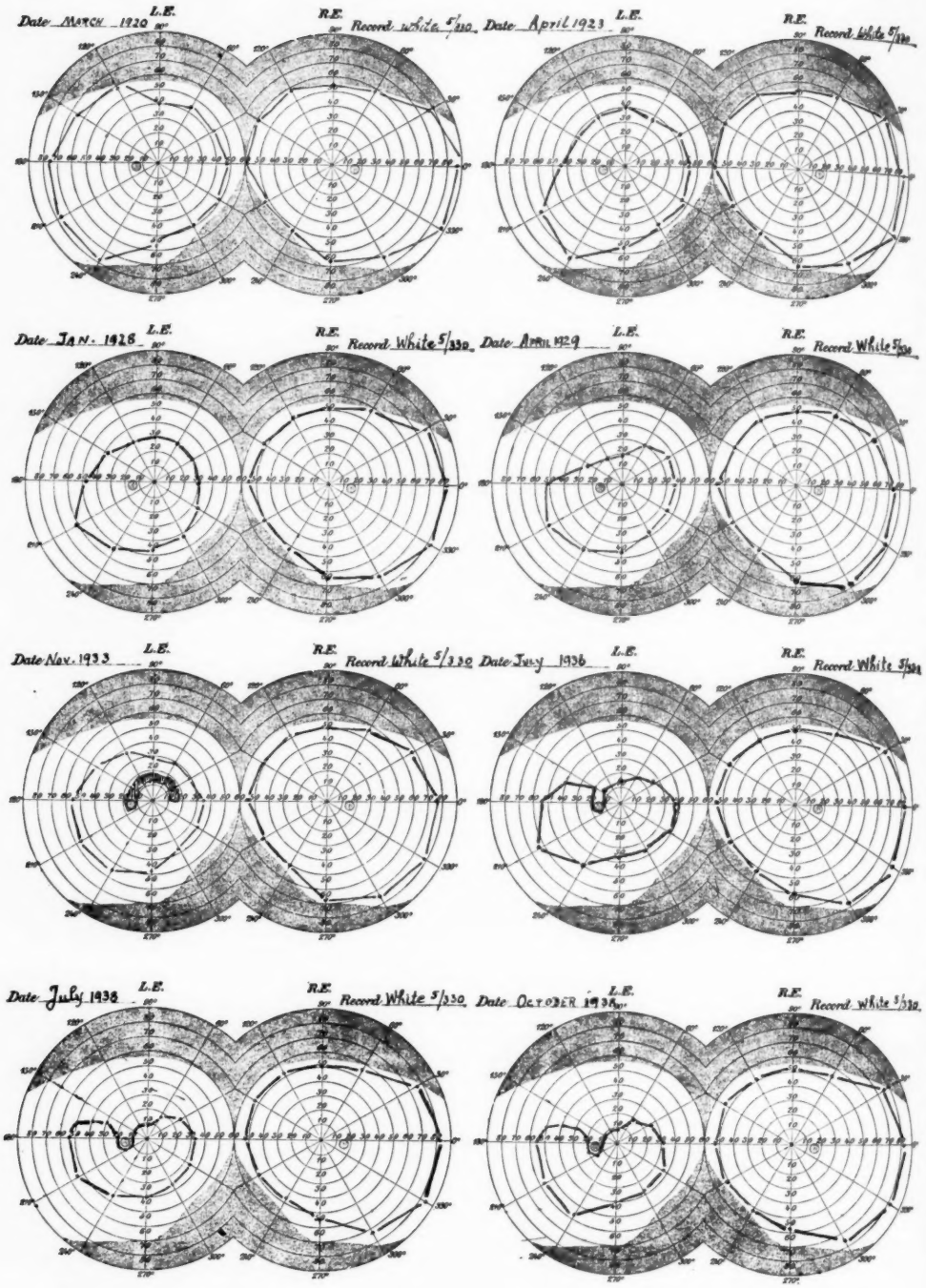

Fig. 1 (Schoenberg). Record of fields of vision from March, 1920, to October, 1938.

drops and the acuity of vision and fields showed definite deterioration, it was decided to operate on the left eye before it should become more seriously damaged. An Elliot trephining was performed; this, 18 years ago.

The right eye was watched for about one year. During this time the patient had several minor attacks of ocular hypertension, "rainbows," and cloudiness of vision—whenever he neglected the instillations of the drops in his right eye. Even after an iridectomy, pilocarpine had to be instilled once or twice daily to keep the tension within normal limits. The left eye kept its normal tension right along, without any drops. The rest of the story can be more easily grasped by studying chart 1.

Notice the tendency of the tension curve of the right eye to be somewhat higher than normal, especially when the patient neglected to use the pilocarpine regularly. However, occasionally the tension remained normal in this eye for a few months without drops.

The tension curve of the left eye remained normal for 18 years without the use of drops. In June, 1938, an acute crisis occurred. It consisted of severe pain on the left side of the head and in the left eye and blurring of vision.

This crisis yielded to frequent instillations of pilocarpine, 2 percent (every one to two hours), and ice applications. After a few days the tension was reduced to a level much below the patient's average normal (see chart 1). A few weeks later, it returned to its previous normal level (18 mm. Hg) and remained there without the use of any more drops.

In spite of the persisting normal ocular tension in the left eye, during the course of 18 years, the field of vision underwent a very slow, partial deterioration which, however, did not involve the central vision. This fact suggests that the damage to the optic nerve in this eye was due to a factor other than ocular hypertension.

The record of this case, though incomplete in many respects, deserves to be reported for the following reasons:

1. It affords the opportunity of visualizing the course of the ocular tension, acuity of vision, and fields of vision of both eyes over a period of 18 years after an operation.

2. It relates the recurrence of ocular hypertension in one eye after these many years. The recurrence was not due to a uveitis nor to a subluxation of the lens; both are readily recognizable by a careful examination. One may safely dismiss the question of closure of the trephine opening or of other parts of the drainage system (angle of the anterior chamber, Schlemm's canal, venae vorticosae, or of the retinal veins), because this sort of closure is organic and quite permanent and is not liable to respond readily to pilocarpine, as it did in this patient. (See tension curve in chart 1 after the acute crisis.)

3. It brings to the foreground the question: "What might be the meaning of the marked drop of the ocular tension in eyes which have just passed through a crisis of ocular hypertension?" Is this hypotension due to the intensive treatment during the attack or to a collapse of the factors which bring about the ocular hypertension?

4. It suggests that no case of glaucoma which remains well for a number of years may be considered as permanently cured, because of the possibility of a late recurrence of ocular hypertension or of a very slowly progressing optic atrophy.

667 Madison Avenue.

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A SUBSTITUTE FOR THE HILDRETH LAMP AND A NEW USE FOR BOTH

MEYER H. RIWCHUN, M.D., F.A.C.S.
Buffalo, New York

The Hildreth lamp has been a most valuable addition to the ophthalmologist's armamentarium. Many men, either because of lack of space or limited finance, have failed to avail themselves of this lamp even though they admit its need and usefulness.

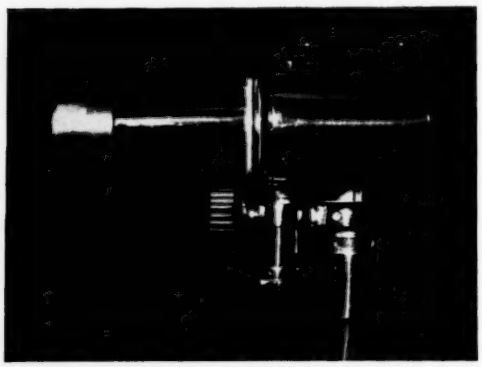

Fig. 1 (Riwchun). A filter caps the end of the operating lamp.

At the last academy meeting in Washington, D.C., I spoke to Dr. Max Poser and Mr. Howard Trimby of the Bausch and Lomb Optical Company about a filter on their operating lamp that could be used as a substitute. They constructed one for me as illustrated. The glass used is their no. 584 ultraviolet glass with absorption based on a 2.07-mm. unit of thickness. The secret of its effectiveness in the fluorescence of the crystalline-lens substance is based on the restrictive transmission of between 4,000 and 3,000 angstrom units. The maximum transmission point is at about 3,600 A.U.

Using this filter on the regular Bausch anl Lomb operating lamp with maximum current control of light, a good fluorescence of the crystalline lens[1] is obtained; not so efficient as that from the Hildreth lamp but quite practical. At the present writing we are working on a lower-voltage bulb that can be overloaded (similar to a photoflood bulb) and hence give more light to step up the efficiency.

I find this filter very useful in the examination of corneal ulcers, erosions, and abrasions. After the cornea has been stained with fluorescein in the usual manner, the room is darkened and the light focused on the eye. The stained area stands out in startling contrast and a better picture of the extent and size of the lesion is obtained than has heretofore been possible. Perhaps additional uses for this filter[2] may be uncovered by more universal use.

The advantage of this filter is its low cost (around $5.00), simplicity of operation, and adaptability to one's present equipment.

367 Linwood Avenue.

REFERENCES

[1] Hildreth, H. R. Amer. Jour. Ophth., 1938, Ser. 3, v. 21, no. 3, p. 299.
[2] ———. Amer. Jour. Ophth., 1936, v. 19, no. 9, p. 770.

A TOOTHLESS IRIS FORCEPS

M. LOMBARDO, M.D., F.A.C.S.
Brooklyn, New York

The main complication due to the use of toothed forceps is the subject of an article by Kornelia Graf (Amer. Jour. Ophth., 1932, v. 15, p. 162) entitled "Iridectomy and lens injury." The author studied histologically the excised piece of iris from each of 22 cases of iridectomy for glaucoma. Lens capsule was found

adherent to the iris four times and in each instance a toothed forceps had been used. Loose capsule was also found in three cases out of 23 iridectomies done for other purposes, in which the same type of forceps had been used, while no such complication was observed in another series of nine cases in which iridectomy had been performed with anatomical forceps. From the evidence obtained the writer concludes that the toothed iris forceps is a dangerous instrument.

A toothless iris forceps* which I have been using in recent years is shown in the accompanying illustration. It is made in a long model of 9.5 cm. and a short model of 6.5 cm. The branches of each model end in a slight curve and present a special rasplike surface on the inner side of the terminal three millimeters.

The advantages derived from this new type of forceps can be summarized as follows: (1) The gentle curve allows the branches when closed to enter and proceed easily into the empty anterior chamber as far as desired, even to the margin of a contracted pupil. (2) The forceps by its rasplike surface is able to grasp firmly the proper amount of iris tissue, preventing it from slipping away before the excision can be performed. (3) The iris can be instantaneously released by simply reopening the branches at any time. (4) The lens is not injured during the manipulations of the forceps; the elimination of teeth, in fact, avoids the perforation of the thin iridic membrane and then the injuring of the underlying lens capsule. (5) The instrument can be used as a blunt capsule forceps: it can grasp the intact capsule or its right and left halves after it has been split vertically with the cystotome.

Fig. 1 (Lombardo). A toothless iris forceps.

*The instrument is made by E. B. Meyrowitz Company, New York, New York.

142 Joralemon Street.

SOCIETY PROCEEDINGS

Edited by Dr. H. Rommel Hildreth

CHICAGO OPHTHALMOLOGICAL SOCIETY

October 24, 1938

Dr. Georgiana D. Theobald, *president*

Kodachrome clinic, Series III

Dr. Robert von der Heydt presented a new series of 75 Kodachrome fundus and anterior-eye photographs of clinical cases.

Discussion. Dr. Elias Selinger asked Dr. von der Heydt how it was determined that the dermatitis shown in one of the patients was a result of the quinine treatment. He recalled three patients, treated for trachoma with quinine bisulfate, who developed a dermatitis of the lids. Treatment was discontinued for awhile and then different medication was used. The dermatitis recurred after each form of treatment—copper stick, bichloride of mercury, chaulmoogra oil, boric acid, and other drugs. On doing patch tests it was found that each of the three patients was allergic to the pontocain that was used as a preliminary anesthetic. When a different local anesthetic was used there was no further difficulty with the quinine medication. There is little doubt that quinine, like other drugs, may induce a dermatitis, but one should remember that local anesthetics used as premedication may be the cause of a dermatitis.

Dr. Robert von der Heydt said that he had no explanation for the occurrence of dermatitis in this case. A series of 16 patients at the Infirmary were treated with sulfanilamide, and when they were photographed the patient was brought to him with this diagnosis. He said that Dr. Selinger has made an important addition to our therapeutic armamentarium by his use of quinine bisulfate in the treatment of trachoma, and no criticism was intended. It is quite probable that the dermatitis was instigated by an anesthetic.

Ophthalmic surgery at missions in India

Dr. Samuel Higgins read a paper on this subject which will be published in this Journal.

Senile cataract: the usual method of operating in India

Dr. William A. Fisher read a paper on this subject which is published in this issue of the Journal.

Discussion. Dr. Harry Woodruff said that when Colonel Smith visited America a number of years ago, he made the statement that some method would be found to paralyze the orbicularis muscle. He certainly recognized that control of this muscle is an important factor in the intracapsular operation. Not only has this been brought about by either the Van Lint or O'Brien methods, but also more thorough anesthesia has been obtained by intraorbital injections. The intracapsular method is now apparently as safe as the extracapsular method.

Dr. O. B. Nugent was of the opinion that whatever one might say about the Smith operation—good or bad—from that operation has been salvaged much that is used in modern operations; namely, the method of expressing the lens. Credit must be given to Colonel Smith for that part in the modern method of cataract extraction.

Dr. Samuel Higgins (closing) repeated that his choice of operation came after many years' experience with various methods. His early training had been with the extracapsular operation, which was followed by intracapsular methods, both

the Smith Indian and the Barraquer. At home and in India he used the intracapsular operation as described by Elschnig, though this might not be the easiest technique for the occasional operator. Following his experience in India with the Elschnig operation, he felt that it was suitable for cataracts in any stage of maturity. However, while the technique permits removal of many immature cataracts, he did not advocate operating on obviously immature cataractous lenses by any method. Due consideration should be given to the patient's complaint of visual disability.

Dr. W. A. Fisher (closing) said that many competent surgeons have a routine preparation of the patient while waiting for cocainization. Novocaine injection is made to paralyze the orbicularis muscle, then a suture is placed in the superior rectus muscle to draw the eyeball downward when necessary for making the toilet, and a suture is made in the skin of the upper and lower lids to be tied when the operation is finished. Many also place one or two, and sometimes more, conjunctival sutures to be tied when the operation is finished. He believed that more harm than good can be done by such preparation (except the cocainization).

The injections cause pain and often make jumpy patients out of some that would be model patients. Suturing of the lids is not necessary when novocaine is not injected and the superior-rectus-muscle suture is unnecessary when the Smith operation is selected, because looking favors making the toilet, and finally, a cataract operation can usually be made painless if the injections are omitted. As stated before, he believed that the best results would be obtained after an intracapsular operation by adhering to the Smith Indian method unmodified.

Robert von der Heydt,
Recorder.

NEW YORK SOCIETY FOR CLINICAL OPHTHALMOLOGY

October 3, 1938

Dr. Percy Fridenberg, *president*

Symposium on slitlamp microscopy

Dr. Phillips Thygeson (by invitation) spoke on slitlamp microscopy of the conjunctiva and cornea. He gave a description of the histo-pathologic changes in the fornices, conjunctivae, and superficial layers of the cornea in trachoma. The differential diagnosis between folliculosis and the subepithelial infiltration of trachoma in its early stage could be made only by biomicroscopy. He also spoke of the conjunctival findings in the prexerotic stage, as well as of Herbert's "pits" resulting from absorbed limbal follicles.

Dr. Morris Davidson stated that retroillumination is very effective in discovering overlooked imbedded corneal foreign bodies.

Dr. Mark J. Schoenberg spoke on the iris and aqueous. The speaker presented the method used in examining these areas, and the common features encountered in their study.

Dr. Arthur J. Bedell described the lens. This presentation consisted of the screen projection of photographic records of the anterior eyeball, demonstrating lens pathology.

Dr. Daniel Kirby discussed the development and structure of the lens, then the special pathology of swollen lenses, and glaucoma in relation to cataract and other diseases.

Dr. Milton L. Berliner presented the chemical, anatomical, and biomicroscopical phases of the vitreous.

Dr. John N. Evans (by invitation) presented a number of original ideas in spectroscopy, filters, and polarization, in

the form of adjunct apparatus to the slit-lamp.

Louis A. Feldman,
Transaction Editor.

SAINT LOUIS OPHTHALMIC SOCIETY

October 14, 1938

DR. ROY E. MASON, *president*

OCULAR FACTORS IN POOR READERS IN THE SAINT LOUIS PUBLIC SCHOOLS

DR. F. O. SCHWARTZ read a paper on this subject which will be published in this Journal.

PAREDRINE AS A CYCLOPLEGIC

DR. ALAN D. CALHOUN read a paper on this subject.

Discussion. Dr. John Green said that paredrine (B-4 hydroxylphenylsopropylamine) is not a new drug. It was originally entered in the German Patent Office in 1913, and belongs to the class of sympathomimetic drugs; its chemical structure is closely allied to that of epinephrine and ephedrine.

A recent pharmacologic study by Abbot and Henry (Amer. Jour. Med. Sci., 1937, p. 661) disclosed the following: 1. It increases the blood pressure (10-20 mg. subcutaneously, 20-40 mg. by mouth); 2. The central nervous system is stimulated, probably due to increased flow of blood to the brain; 3. By topical application (3-percent solution) it is as effective in relieving congestion of the nasal mucosa as a 3-percent solution of ephedrine. It has, however, the disadvantage of not being soluble in oil.

In percentages varying from 0.15 to 2, it acts as a mydriatic, but not as a cycloplegic; that is, these authors found no loss of accommodation following the instillation of the drug alone. There was no conjunctival nor ciliary congestion and no increase in intraocular pressure.

A recent study by Sudranski (Arch. of Ophth., 1938, v. 20, no. 4, p. 585) indicates that benzedrine (a drug closely allied to paredrine) is totally lacking in cycloplegic effect. He questions the synergistic effect of the two drugs in combination, believing that a 5-percent solution of homatropine alone uncovers 90 percent of the hyperopia and is efficient alone in the production of transitory, but clinically efficient, cycloplegia. Further studies are needed to get at the truth of the matter.

Dr. Lawrence Post said that they had been using paredrine for a few months, but not in the critical manner of Dr. Calhoun. They did take the near point and found some residual accommodation, the near point being 29 cm. to 30 cm. instead of 33 cm., which was not very different from that in a group of patients in whom they used five instillations of 2-percent homatropine. Their method was to use a drop of 5-percent homatropine and three minutes later a drop of paredrine. The method has the advantage of quick recovery. It is simpler in children because of the fewer instillations and is of advantage to the group of patients who must use their eyes the following day.

Dr. Calhoun said that he would like to test how much cycloplegic effect was obtained with a drop of 5-percent homatropine. It is true that Drs. Abbott and Henry did say there was no cycloplegic effect with paredrine alone. He intends to study a series of cases using 5-percent homatropine alone.

SULFANILAMIDE THERAPY IN OCULAR DISEASES

DR. J. M. KELLER read a paper on this subject.

Discussion. Dr. Lawrence Post said he had recently returned from a conference

of the Indian Service. There were enthusiastic reports of the use of sulfanilamide among the Indians. One was a report of 112 cases followed for six months in which all but eight were reported as cured or arrested. They were talking of the possibility of the elimination of the disease among the Indians in a few years' time. They use one-third grain per body weight, per day. It can be obtained in tablet form. The usual course used in Indian children originally ran for three weeks. They decided to give it a little more intermittently after the first week and ran it to six weeks' time. Patients were cautioned to take things easy during the course of the treatment. The blood picture was carefully observed. Soda bicarbonate was given in equal amounts with the sulfanilamide.

Dr. Max W. Jacobs stated that he recently saw a patient who suffered severely as a result of exposure to sunlight while taking sulfanilamide. This case showed how essential it is to know how the blood is behaving and that there are risks in giving the drug to ambulatory patients.

Dr. Keller said that older patients were carefully examined before sulfanilamide was administered. In one trachoma case in which he used sulfanilamide the vision after two days had certainly improved. The case, however, is one complicated with keratitis. In the other case of trachoma there was a black conjunctiva from the use of so much silver. He believed it not necessary to use the high dosage of sulfanilamide. Such cases will respond to small doses as well. If the condition does not show any improvement in a week, sulfanilamide will do no good.

H. Rommel Hildreth,
Editor.

AMERICAN JOURNAL OF OPHTHALMOLOGY

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Author's proofs should be corrected and returned within forty-eight hours to the *Manuscript Editor.* Twenty-five reprints of each article will be supplied to the author without charge. Additional reprints may be obtained from the printer, the George Banta Publishing Company, 450-458 Ahnaip Street, Menasha, Wisconsin, if ordered at the time proofs are returned. But reprints to contain colored plates must be ordered when the article is accepted.

MEETING OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY

The American Ophthalmological Society held its seventy-fifth annual meeting on June 5, 6, and 7, 1939, at Hot Springs, Virginia. One hundred thirty-five members and guests were registered, the largest attendance on record. Mr. H. M. Traquair of Edinburgh was the guest of honor and spoke on "Some problems in perimetry" at the session on June 6th. That evening a banquet celebrating the anniversary was held. The president of the society, Dr. Frederick T. Tooke of Montreal, presided. Mr. Traquair spoke on "The Ophthalmological Society of the United Kingdom," Dr. Harry Friedenwald of Baltimore gave an exhaustive and scholarly address on "The American Ophthalmological Society, a retrospect of 75 years," and Dr. Bernard Samuels of New York spoke on "Edward Delafield, a sketch," illustrating his talk with interesting lantern slides of Delafield and his times. The members, guests, and their ladies enjoyed the occasion, which incidentally was held exactly 75 years to the day from the time of the founding of the Society.

Twenty-six papers were read, including that of Mr. Traquair. These covered a wide range of subjects and were unusually good. Most of them were of clinical moment, but several were pure research in nature, with much promise for future clinical application. The discussions were interesting, but the length

of the program no doubt decreased to some extent the number of discussers. The weather and arrangements were perfect, and the social side of the activities left nothing to be desired.

Dr. E. V. L. Brown of Chicago was elected president, and Dr. F. Phinizy Calhoun of Atlanta vice-president for the ensuing year. Dr. Eugene Blake of New Haven was reëlected secretary.

A group photograph of the members taken on the terrace of The Homestead in brilliant sunshine on June 6th will serve as a permanent souvenir of the event.

Derrick Vail.

STERILIZATION FOR HEREDITARY EYE DISEASE

Modern civilization has been accused of running counter to the laws of evolution by preserving the physically weak. War destroys the finest physical specimens, while medical science and public health administrations prolong the lives of those who in earlier centuries would have been eliminated from the struggle at an early age.

The present rulers of the German people, with their doctrine of racial purity and their apparent ambitions toward world supremacy, have moved more radically than any other government in the direction of sterilization of the unfit.

There are differences of opinion as to how far sterilization succeeds in attaining its ends. As regards some forms of mental and moral defectiveness, it has been argued that the outcome is problematic and that society is just as likely to be the loser as the winner if reproduction is interfered with. Most physicians, however, would probably favor a well-controlled scheme for sterilization of the worst type of criminal, the hopelessly insane, and the imbecile, as well as some morons whose sexual instincts are dangerous to themselves or to others.

In view of the law enacted by the National Social Democratic Workmen's Party, (the "Nazis,") it is not surprising that during the last few years discussions as to the extent to which certain conditions justify sterilization have been frequent in German eye journals. Among the disorders to which the arguments for and against have been applied may be mentioned congenital anophthalmos or microphthalmos, pigmentary degeneration of the retina, high myopia of the degenerative type, and congenital cataract.

At the last meeting of the German Ophthalmological Society in Heidelberg (Klinische Monatsblätter für Augenheilkunde, 1938, volume 101, page 134) Fleischer raised the question whether the possibility of treatment of an inherited disorder excluded the application of the "law for prevention of hereditarily diseased offspring." He pointed out that, while the results of operation on non-hereditary congenital cataract were relatively favorable, the outcome tended to be much less satisfactory in hereditary cataract, where only about sixteen percent showed corrected vision of a sufficiently useful amount. Hereditary cataract is frequently complicated by the presence of other defects, such as microphthalmos, nystagmus, and amblyopia. Fleischer therefore argued that hereditary cataract was to be regarded as demanding action in accordance with the spirit of the German sterilization law, "to preserve the health of coming generations and therefore of the nation as a whole."

A number of well-known German ophthalmologists who took part in the discussion of Fleischer's paper did not hesitate to criticize his attitude as excessively radical. Engelking said em-

phatically that in order to save the law from being brought into bad repute, one could not advise strongly enough against such a proposal. The operative technique of the future is likely to be at least not inferior to that of today. No healthy person can be absolutely certain that his descendants will not show such a disorder as pigmentary degeneration of the retina, or any other hereditary defect. Engelking further reminded his audience that total color-blindness had been named among the disorders calling for sterilization, although it would obviously be undesirable to sterilize any completely color-blind person in the presence of full visual acuity.

As regards several conditions of supposedly hereditary character, it might take several generations to demonstrate heredity so clearly and to such a degree as to justify sterilization.

It has been argued that victims of hereditary cataract should be sterilized if they showed an unsatisfactory visual result after operation; it being reasoned that this could be taken as evidence against the probability of their begetting offspring free from disabling hereditary disease. But it must not be forgotten that a poor visual result after a cataract operation is sometimes due to unrecognized defects of operative technique. On the basis of this possibility, Clausen insisted that sterilization could only be justified if the vision remained very low after an operation as to whose technical perfection there could be no possible shadow of doubt.

Whatever individual judgments may be offered regarding the justice or expediency of the German law on this subject, the law is likely at least to stimulate the accumulation of valuable statistical knowledge. Lange (Klinische Monatsblätter für Augenheilkunde, 1938, volume 101, page 854), working under Clausen, has gathered the records of all cases of retinal glioma handled in the Halle clinic, during the past 22 years, giving special attention to the question of heredity.

It has apparently been held necessary under the German law to report cases of retinal glioma and to submit the patients to sterilization. A number of professional voices have ventured to criticize this requirement. Stock, at Tübingen, could find no certain case of heredity among 28 glioma patients, while Reiser discovered only one unquestionable case of heredity among 16 such patients.

Lange's material includes a total of 35 cases, to which he adds an earlier case in the person of the father of two of the 35 recent subjects.

To the credit, perhaps, of absolute rulership, it is recorded that with the help of the post office department, of an official whose duty it is to keep memoranda with regard to those who live in each given community, and of the state public health official, questionnaires properly filled in were received concerning all the 36 patients! In a number of cases it was even possible to reëxamine the patients and some of their relatives. Twenty, or 55.6 percent of the patients still survived, the longest interval being 22 years. The quoted figures of a number of other authors show a similar percentage of recoveries.

No bilateral case in the Halle clinic survived, except one child for whom the parents had refused enucleation eighteen months before the date of Lange's report. However, it must be remembered that bilateral enucleation is very seldom decided upon and hardly ever receives the consent of the parents.

Bilateral cases represented 30 percent of the Halle patients, as compared with an average of 25.7 percent in the literature of the subject as reviewed by Lange.

An attempt (perhaps statistically of questionable authenticity, in view of the fact that the first child is often the last child) was made to show that glioma is commoner among first-born than later-born children.

Lange is firmly convinced that glioma of the retina can be hereditary. Bilateral cases seem to occur rather more frequently in children one of whose parents has also had the disease. But there would be little purpose in sterilizing the unfortunate victims of bilateral glioma, for they have no opportunity to reach the age of reproduction.

Apart from religious scruples, there can be little question as to the right and propriety of sterilization for the protection of future generations. To determine the exact limits within which such a principle shall be put into practice is a much more difficult matter. It seems by no means impossible, moreover, that under an autocratic government the power of legalized sterilization might sooner or later be grievously abused.

W. H. Crisp.

PREVENTION OF BLINDNESS

Blindness is to be "partially or wholly deprived of sight." That is the definition from the dictionary. In popular use it means to be unable to do by sight what other people can do by seeing. The committee of the Section on Ophthalmology of the American Medical Association, which drew up a definition of the word, found that it was used with so many different meanings that it was necessary to recognize, by qualifying words, different kinds and degrees of blindness. Total absence of light perception is rare. The great mass of people who are rated as blind and are on relief rolls or in scientific statistics are those who have impaired vision, varying in the amount of such impairment. In this sense the prevention of blindess is the prevention of impairment of vision.

The ophthalmologist confronted by anomaly, disease, or injury of an eye has to deal with a single problem of diagnosis and treatment. One who seeks to prevent blindness has a much broader problem, or association of broader problems, and various possibilities to consider. Prevention is better than cure, confers a greater benefit. But dealing with general prevention is a much broader, more difficult, and more permanent problem. Although in some cases a lasting or recurring disease, like trachoma or iritis, may need attention for years, prevention of blindness is always important for every one. The prevention of blindness needs thought, study, and determined action in many directions.

The first thing to be done is to bring about good lighting. The practice of calling night "blindman's holiday," recognizes that without light all are equally blind. The task of determining and teaching what is good lighting is a great duty, and a great opportunity for ophthalmologists. Next to it comes the duty of securing equal opportunities for children in the schools by testing the sight (and hearing) of each child who goes to school. When we can tell the teacher where each child must sit in order to see enough to read what he is expected to read, we will practice sight-saving and prevention of blindness, and the child will have a fair chance to do the school work expected of him. Correction of errors of refraction is a step in the prevention of blindness. But parents do not know when their children need such help. Teachers and school nurses can only guess at it. And, because of this ignorance, many children are condemned by the school system to remain ignorant.

They often become a public charge, because no effort has been made to prevent their ultimate blindess. Prevention of blindness is a live issue; something to be done for the scholar and for the taxpayer.

Edward Jackson.

A DIGEST OF CURRENT LITERATURE

The passing of the Ophthalmic Year Book some 10 years ago was an inestimable loss to the profession. The need of such a digest has continued to be felt keenly by all English writers on ophthalmological subjects. From time to time efforts have been made to find ways and means to revive it, but thus far without success. Recently, as evidence of the continued interest, committees were appointed from the national societies to confer on the subject.

The actual number of persons who are interested in full abstracts of all articles from the literature is relatively small, if one may judge by the subscription list of the Year Book while it was an independent publication. This never reached 500 names, but those who do want a complete digest are very urgent in the desire. Apparently they wish a reference book from which they can get complete abstracts of all articles that pertain to the subject about which they are seeking information, so that they will not be forced to go to the original sources, which are often difficult to obtain and frequently are written in a language unfamiliar to them.

In order to fill this need in so far as possible, this Journal has, since the discontinuance of the Year Book, enlarged the abstract department so that approximately 90 percent of the world's ophthalmic literature is abstracted in its columns. Of necessity many of these abstracts are condensed to the ultimate, all non-essentials being culled out. This is satisfactory for those who wish merely to keep informed on matters of current interest but often does not give sufficient detail for one who wishes to use it as the only source for special information on a given subject The only journal that has come near to fulfilling such an object has been the Zentralblatt für die gesamte Ophthalmologie und ihre Grenzgebiete, but this has been published in German, is very expensive, and not available to many even if they could translate the articles. Furthermore, it is doubtful that this journal will be continued, owing to recent changes in Germany.

Whether this latest effort on the part of our societies to provide some complete and full abstract journal or digest will succeed remains to be seen. The essential need is money. It is scarcely conceivable that there are enough potential subscribers to finance more than a part of it. The project is very expensive. A full-time editor, secretary, and a fairly large group of abstracters must be provided. Printing costs are high. Subscriptions probably would cover about one third of the undertaking, but this would leave some six to ten thousand dollars to be raised annually by other means. If one of the Foundations could be interested in the project sufficiently to endow it to the necessary extent, the plan might be put through. If financial backing can be found the mechanics of production can probably be arranged.

In the meantime this Journal will endeavor to cover the field in its abstract department as completely as possible.

Lawrence T. Post.

BOOK NOTICES

ANUARIO MEDICO-SOCIAL DE CUBA. Edited by Dr. Thomas R. Yanes. Cloth cover, 559 pages. Published under the auspices of the Re-

vista Cubana de Oto-Neuro-Oftalmiatria. Havana, Ucar, Garcia, y Cia, 1938. Price $3.00.

The first edition of this excellent and enterprising publication was reviewed in the Journal a little over a year ago (1938, v. 21, p. 317). As mentioned at that time, the directory is unusual in the scope of its information, presenting particulars not only with regard to every Cuban physician but the full name of his wife and of each son and daughter, if any. The present volume differs from the preceding one chiefly in omission of introductory chapters dealing with prehistoric medicine in Cuba, the history of the University of Havana and its medical department, the history of medicine and surgery in Cuba, the history of the medical press in Cuba, Cuban medical associations and congresses, and the history of local hospitals and clinical institutions. A number of leading specialists are again caricatured in full-page drawings.

W. H. Crisp.

ESTRABISMO. By Jorge Malbran and Esteban Adrogué. Paper bound, 471 pages, with 122 figures. Published in Buenos Aires, by "El Ateneo," 1938.

In the preface to this scholarly volume the authors state they had two purposes in mind: The first was to bring the present knowledge of strabismus up to date, and the second to expound a new hypothesis about visual spatial sense.

The subject matter divides itself conveniently into two parts, one dealing with the normal physiology and the second with the aberrations, or pathology. In the physiological section, which takes up visual perception and projection, ocular movements, and fusion, for the most part the ideas of recognized authorities are presented. Of these, Hoffman and Bielschowsky are most frequently quoted. The authors' own hypothesis about visual spatial sense attacks the concepts of innate retinal sensorial correspondence. Only 40 percent of their cases of strabismus showed "normal retinal correspondence." In the other 60 percent there existed an association of retinal points which was quite unlike that found in normal individuals. It is the authors' conviction that sensorial fusion is secondary to the optical projection into space of both eyes. Motor fusion is innate, and on this sensory fusion is built later.

The larger part of the book is devoted to the pathological section, which includes disturbances of muscular equilibrium, manifest strabismus, examination and apparatus, etiology, and treatment. The data are presented fully and in logical sequence. Proponents of various theories relative to controversial points are quoted and their opinions discussed. The authors' personal views correspond in general with the most widely accepted teachings in this country. One might take exception to a few statements, such as the assertion that all patients having monocular strabismus of high degree should be operated on by the age of three years. A welcome note of warning is sounded against relegating orthoptic training too much to technicians, without adequate supervision by the surgeon.

There is no alphabetical index, its place being taken by a table of contents with a summary of each chapter. A bibliography of 354 authors adds to the importance of this work and will greatly increase its usefulness.

Frederick A. Wies, M.D.

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP
ASSISTED BY DR. GEORGE A. FILMER

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy, embryology, and comparative ophthalmology

7

UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Cassuto, Nathan. **A bilateral iris malformation.** Boll. d'Ocul., 1938, v. 17, July, pp. 576-592.

A girl of seven years showed in the anterior chamber an iris-like membrane, attached posteriorly to the base of the iris and anteriorly to the posterior surface of the cornea. A discussion of the interpretation of similar anomalies is given, and the conclusion reached that this case was the result of an anomaly of development of the anterior chamber combined with a defect in the endothelial formation. (Bibliography, 4 figures.) M. Lombardo.

Grandi, G. **Contribution to the study of diabetic "rubeosis iridis."** Boll. d'Ocul., 1938, v. 17, June, pp. 484-491.

A man of 69 years affected by failing vision of both eyes for about a year showed two reddish spots at the inferoexternal sector of the sphincteric zone of the left pupil. By slitlamp these appeared to be formed by a capillary network from which three larger blood vessels departed toward the iris base. In addition, other fundus lesions were present. The patient was found to have a hyperglycemia which dropped to within normal limits under proper diet. This case confirms the well-known fact that rubeosis iridis is a manifestation of diabetes and gives a bad prognosis for the eye. The writer opines that this vascular neoformation is related to increased blood pressure. (Bibliography.) M. Lombardo.

Gullberg, J. E., Olmsted, J. M. D., and Wagman, I. H. **Reciprocal action of constrictor and dilator pupillae during light adaptation.** Proc. Soc. Exper. Biol. and Med., 1938, v. 38, June, p. 616.

Measurements of pupillary size during various conditions of light adaptation were made by infrared photography. In the dark-adapted eye the pupil was smallest when the sympathetic nerves were cut, there being no equilibrium between the elasticity of the iris and the "residual tone" of the sphincter. The pupil was slightly larger when both the sympathetic and oculo-

motor nerves were cut. The pupil was next larger in the normal eye in dark adaptation. Maximal dilatation resulted when the oculomotor nerve was cut or atropine was instilled into the normal eye. John C. Long.

Heath, P., and Geiter, C. W. **Some physiologic and pharmacologic reactions of isolated iris muscles.** Arch. of Ophth., 1939, v. 21, Jan., pp. 35-44.

A new autographic method was used for the experimental study of the reactions of isolated iris muscle of the rabbit and dog. Both physiologic and pharmacologic stimulators and depressors were employed. This delicate method showed physiologic tissue response and permitted pharmacologic instead of toxic reactions. An irregular spontaneous rhythm was found in the relaxed muscle. The smooth iris muscle had qualities in general like those of other smooth muscles. It is concluded that the sphincter and dilator do not oppose one another's action but coöperate, and that the total work power of the dilators is greater than that of the sphincters. The ion reactions as found by Poos were duplicated. The sphincter reacted to parasympathetic stimulators but these had no effect on the relaxed dilator. The dilator fibers reacted to sympathetic stimulators. Atropine and its group relaxed the sphincter and also relaxed the dilator. An increase of tonus was accomplished by cooling, alkalization, and mechanical stimulation; and a decrease by acidification, heat, previous disease, and age of tissue. J. Hewitt Judd.

Osterberg, G. **Iritis Boeck (sarcoid of Boeck in iris).** Brit. Jour. Ophth., 1939, v. 23, March, pp. 145-160.

Boeck's supposition advanced in 1899 that dermal sarcoid might affect other tissues beside the skin has been confirmed in the literature since that time. The reviews and findings of Waldenström, Schaumann, Pautrier, Oberling, and others are cited to this effect. Boeck's disease has been found to occur in the lacrimal glands, salivary glands, epididymis, mamma, cardiac muscle, and mucous membrane of the lacrimal duct. Four or five cases have been reported where patients having the disease died of cardiac debility. As for the eye, the disease involves the conjunctiva, cornea, iris, choroid, and optic nerve. Iritis is said to be quite common among those having Boeck's disease, there being five cases of iritis noted out of twenty afflicted with Boeck's. Regardless of difference of viewpoints, authors agree that clinically iritis Boeck closely resembles tuberculous iritis. (Tables, figures, references.) D. F. Harbridge.

Robertson, J. D. **The chemical equilibrium of the interstitial fluids and the aqueous humor.** Brit. Jour. Ophth., 1939, v. 23, March, pp. 170-190.

The author limits his discussion, not suitable for abstract, to the aspects of the chemical equilibrium that exists between (1) blood and lymph, (2) blood and gastric juice, and (3) blood and aqueous humor. Each of these three classifications is fully discussed, the author concluding that the aqueous humor cannot be considered as a simple, protein-free ultrafiltrate or dialysate of blood plasma, but that it is a specialized fluid manufactured for a specific purpose. (Figures, references.) D. F. Harbridge.

Robertson, J. D. **The theories on the formation of the aqueous humor.** Brit. Jour. Ophth., 1939, v. 23, April, pp. 243-250.

The controversial subject of the theories regarding the formation of the

aqueous is presented. The author discusses the crystalloids and colloids and the permeability of the membranes as a preliminary to the definitions advanced for dialysate, ultrafiltrate, exudate, transudate, and secretion before going into the theories of the subject itself. These definitions are considered and explained in full, it being the conclusion of the author that the aqueous humor is produced by secretion as based on physiological facts rather than on generally accepted data as to anatomy of the ciliary processes, functional activity, electrical evidence, and so on. (References.) D. F. Harbridge.

Seager, L. D. **Effect of potassium chloride on the normal and denervated iris.** Proc. Soc. Exper. Biol. and Med., 1938, v. 38, June, p. 629.

Camp and Higgins have advanced the hypothesis that epinephrine acts by liberating potassium. Seager found that potassium chloride constricts the pupil of intact and excised eyes of frogs and the normal and sympathectomized iris of rabbits. Epinephrine overcame this constriction even when the dosages of potassium were excessive. These observations do not support the hypothesis that epinephrine acts by liberating potassium. John C. Long.

Sveinsson, Kr. **Choroiditis areata.** Acta Ophth., 1939, v. 17, pt. 1, p. 73.

This phenomenon represents a congenital disturbance in the development of the pigment epithelium and the choroid; it is bilateral and symmetrical, and without any tendency to involve the macula. The fundus picture is that of a circumpapillary choroidal atrophy, extending in radial bands toward the periphery; the atrophic areas, which expose the sclera, are sharply demarcated. Four cases are described in detail. Ray K. Daily.

8

GLAUCOMA AND OCULAR TENSION

Alvis, B. Y. **Management of glaucoma following cataract operation.** Amer. Jour. Ophth., 1939, v. 22, May, pp. 518-525.

Barkan, Otto. **An operative procedure for glaucoma of shallow-chamber type; multiple excisions of the root of the iris and deepening of the anterior chamber.** Arch. of Ophth., 1939, v. 21, Feb., pp. 331-345; also Trans. Sec. on Ophth., Amer. Med. Assoc., 1938, 89th mtg., p. 284.

The mechanical etiology of the shallow-chamber type of primary glaucoma is discussed, together with the technical difficulties and inadequacies of iridectomy. The operation described appears to solve the technical difficulties and dangers of operating in this type of glaucoma. The anterior chamber is deepened by injection of physiologic salt solution or Ringer's solution into the anterior chamber after a posterior sclerotomy or the extraction of vitreous with a Zur Nedden needle. Multiple peripheral iridectomies, usually three, are made through beveled keratome incisions. This type of incision closes in the manner of a valve and allows restoring, maintaining, and deepening of the anterior chamber as often as necessary. There is no marked cosmetic disfigurement, and no appreciable refractive error is caused. The sphincter of the pupil is preserved. Postoperative adhesions at the filtration angle are prevented. The author has used this procedure in fifteen cases, and it promises to answer the purpose of an early or prophylactic operation in this type of glaucoma to avoid the dangers of iritis, late infection, cataract formation, and of a malignant course. Since the postoperative use of miotics

is sometimes necessary, it is not applicable for those patients who are not easily controlled or who cannot report for periodic examination.

J. Hewitt Judd.

Bencini, Alberto. **Holth's iridencleisis and chronic glaucoma**. Boll. d'Ocul., 1938, v. 17, June, pp. 421-443.

The writer mentions the different surgical methods used in chronic simple and chronic inflammatory glaucoma, discussing their advantages and disadvantages. Due to the fact that even the classical Elliot and Lagrange operations may end in disaster, he recently has resorted to iridencleisis with apparently satisfactory results. He reports five patients between 32 and 69 years of age, who had maintained tensions within normal limits for several months following this operation. (10 figures.) M. Lombardo.

Fantl. **Our experience with Lindner's vitreous fistula operation.** Acta Ophth., 1939, v. 17, pt. 1, p. 1.

This detailed analysis of 50 operations on 47 eyes shows that the initial hypotony immediately after the operation is followed by a recurrence of hypertension, and a second operation has to be performed. The operation is thus useful only as a preliminary procedure to reduce intraocular tension in cases in which it is extremely high, or to produce a deep anterior chamber in cases in which it is obliterated. The operation was performed without effect in one case of retinal embolism and in two cases of optic atrophy.

Ray K. Daily.

Fradkin, M. I., Levina, L. C., Stein, F. G., and Shubova, T. B. **Glaucoma and the vegetative nervous system.** Viestnik Opht., 1939, v. 14, pt. 1, p. 3.

The authors attribute the physicochemical and vascular disturbances in glaucoma to a disturbance in the central portion of the vegetative nervous system. They support this contention by the presence of a wide vegetative asymmetry in unilateral glaucoma. The vegetative functions studied in this investigation were the albumen content of experimental cantharides blisters, the water-absorption rate, and the dermographic test. In 21 patients with unilateral glaucoma the response to these tests was asymmetrical on the two sides of the body. A study of the water and the sugar metabolism also indicates a severe disturbance in the central vegetative nervous system. The authors assume that these disturbances are a factor in the etiology of glaucoma.

Ray K. Daily.

Green, A. S., and Green, M. I. **Automatic trephine for glaucoma.** Arch. of Ophth., 1939, v. 21, Feb., pp. 328-330.

The authors discuss the proper technique in the use of their automatic trephine, pointing out that it permits easy manipulation without excessive trauma. They state that its use over a period of ten years has reduced the percentage of complications, resulted in more operative cures, and decreased the period of hospitalization.

J. Hewitt Judd.

Lauber, Hans. **The relationship between intracranial and retinal blood pressure and intraocular tension; the treatment of tabetic optic atrophy.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 661. (See Section 11, Optic nerve and toxic amblyopias.)

Lloyd, J. P. F. **Some experiences of the use of diathermy in increased intraocular tension.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 774.

A discussion of the benefit of high-frequency current in reducing intraocular tension is given. The machine used delivers 600 ma. at approximately 600 kc. The current is passed until the patient gets a sensation of warmth in the eye; this is the only control. The least increase above the comfortably warm stage may burn the skin. (10 case reports.) Beulah Cushman.

Medvedjev, H. I., and Satz, L. B. **The effect of retrobulbar injection on the ocular tonus.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 102.

A tabulated report of thirty clinical cases and the protocols of tests on rabbits. As a result the author questions the validity of Liberman's dictum that there are no contraindications to retrobulbar injections; in some cases of glaucoma an injection of novocaine and adrenalin produced a further rise in intraocular tension. Ray K. Daily.

Miller, E. A. **The treatment of glaucoma with splenic extract.** Amer. Jour. Ophth., 1939, v. 22, May, pp. 536-540.

Möller, H. U. **Symptoms simulating glaucoma in a case of Blumenbach's chordoma.** Acta Ophth., 1939, v. 17, pt. 1, p. 20.

A report of a case in a 49-year-old woman, with excavation of the optic papillae, bilateral Bjerrum scotomata, and normal intraocular tension, produced by a chordoma of the sella turcica. This case supports Traquair's contention that a Bjerrum scotoma and excavation of the optic disc are not pathognomonic for glaucoma. In this case, at operation the optic nerves were found flattened; the excavation of the papillae can be explained by the pressure of the tumor on the prechiasmal portion of the nerves. The scotomata, the author believes, might be due to an arrangement of the nerve fibers at the edge of the papilla similar to that in glaucoma. (Illustrations.)

Ray K. Daily.

Przibilskaja, I. I. **Daily fluctuations in dark adaptation in glaucoma.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 37.

The author urges more frequent dark-adaptation tests in the morning and in the evening as a diagnostic procedure in early glaucoma and as a check on the effectiveness of surgical procedures. In frank glaucoma the difference between the morning and evening curves is very pronounced; at times the threshold of perception in the morning is ten times higher than in the evening. In early cases the difference is from two to four times. The test is applicable in cases with normal daily intraocular tension, in early postoperative cases where instrumentation is undesirable, and in cases with distorted cornea where tonometric findings are unreliable. Ray K. Daily.

Rachevskii, F. A. **The role of the vitreous in the pathogenesis of glaucoma.** Viestnik Opht., 1939, v. 14, pts. 2-4, p. 42.

A review of the literature.

Ray K. Daily.

Rosovskaja, S. B. **The significance of elastotonometry in the diagnosis of glaucoma.** Viestnik Opht., 1939, v. 14, pt. 1, p. 9.

This investigation deals with the effect of surgery and miotics on the elastotonometric curve. The conclusions are that this curve is an expression of the reflex which regulates intraocular tension, and its slightest disturbance reacts on the form and height of this curve. Elastotonometric studies are valuable in the diagnosis of glaucoma,

particularly in its early and prodromal stages; they are especially valuable because they indicate glaucomatous changes even though the intraocular tension be normal. This test can serve to check the effectiveness of new drugs and surgical procedures; if effective the curve returns to normal. Comparative studies of elastotonometric and daily tension curves show complete agreement of data, regardless of the stage and type of glaucoma.

Ray K. Daily.

Zaionchkovskii, M. I. **The influence of barometric pressure and humidity on the blood pressure and intraocular tension of glaucoma patients.** Viestnik Opht., 1939, v. 14, pt. 1, p. 106.

Studies on fifty patients indicate that increased humidity acts unfavorably on glaucoma, particularly on the acute inflammatory type. There is no such relation demonstrable between glaucoma and the barometric pressure.

Ray K. Daily.

9

CRYSTALLINE LENS

Alvis, B. Y. **Management of glaucoma following cataract operation.** Amer. Jour. Ophth., 1939, v. 22, May, pp. 518-525.

Barsoum, Labib. **A case of congenital cyst in anterior chamber of left eye with congenital anterior capsular cataract in both eyes.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 195. (See Section 7, Uveal tract, sympathetic disease, and aqueous humor.)

Bonnet, P., and Grandclément, E. **Postoperative detachment of the choroid (after total cataract extraction).** Arch. d'Opht. etc., 1939, v. 3, Jan., p. 1.

Until about the year 1900, detachment of the choroid was recognized as a complication especially of glaucoma operations. We owe to E. Fuchs revelation of the relative frequency of detachment of the choroid after cataract operation. He discussed the existence of small detachments sometimes latent, which only a systematic ophthalmic examination would uncover. From his first communication in 1900, Fuchs pronounced the prognosis to be favorable. The authors report six cases of choroidal detachment following cataract operation, and which after a variable interval became completely replaced. It is very difficult to give an idea, even approximate, of the relative frequency of postoperative detachment of the choroid. It is probable that a certain number of cases escape observation.

Only six cases of detached choroid were encountered in a total of 1,400 extractions practised at the Ophthalmologic Clinic (the only ones the authors had been able to study systematically when they left the hospital). This is approximately 0.5 percent. The percentage given by Fuchs was 4.7. Hagen gave 22 percent. The operative technique plays no part in production of the condition. Anatomic conditions of the eye itself appear to play the main rôle. Hypertonicity of the globe is of first importance. The opening of the anterior chamber quickly lowers intraocular tension. Alterations of the uveal tract, especially those seen in diabetes, play an important part. Resistance of the zonule may be the cause in certain cases. After the detachment returns to its place one may see plaques of atrophy of the choroid and pigment streaks of the retina. (Color plates, illustrations.) Derrick Vail.

Buxton, Robert. **The intracapsular extraction of cataract with forceps.**

Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 742.

A comparison is made of the complications, as found in the literature, following intracapsular and extracapsular extractions, such as ruptured capsule, vitreous prolapse, and detachment of the retina. The choice of the case for intracapsular operation as to type and age of patient, local disease, exophthalmos, and shallow anterior chamber is discussed; and the kind of operation for the various types of cataract is discussed with details of technique. Beulah Cushman.

Clarke, C. C. **Ectopia lentis; a pathologic and clinical study.** Arch. of Ophth., 1939, v. 21, Jan., pp. 124-153.

This article is based on a review of the literature, a study of 71 globes, and an analysis of 31 case histories. The following anatomic classification is proposed to clarify the clinical study of this condition: grade 1, simple ectopia lentis; grade 2, ectopia lentis combined with anomalies of ocular dimension; grade 3, ectopia lentis combined with anomalies of ocular structure; grade 4, ectopia lentis combined with anomalies of constitution, that is aberrancies of body development. The pathogenesis of ectopia lentis is not understood because of many conflicting theories of etiology. Amblyopia is frequently present and there is a high incidence of strabismus. Phakic refraction nearly always shows myopia. With aphakic refraction, relative myopia is less frequent, but more common than hyperopia. This would indicate that a good deal of the myopia in cases of ectopia lentis is lenticular rather than axial. Loop extraction following a wide preliminary iridectomy offers the best solution to this problem, as the ultimate prognosis for untreated eyes is bad. Discissions and operations on the iris are usually unsatisfactory. (Extensive bibliography.) J. Hewitt Judd.

Cosmettatos, G. F. **Intracapsular cataract extraction.** Ann. d'Ocul., 1939, v. 176, Feb., pp. 127-131.

Intracapsular extraction with peripheral iridectomy is recommended as the operation giving the most satisfactory result. Using Arruga or Kalt forceps, the author was able to deliver 38 percent of 585 cataracts without breaking the capsule. Complications were no more frequent than with the extracapsular method.

John M. McLean.

Dimitry, T. J. **The dislodging force utilized in intracapsular cataract extraction.** Amer. Jour. Ophth., 1939, v. 22, April, pp. 416-418.

Dimitry, T. J. **Evolution of a sucking disc for intracapsular extraction of cataract.** Arch. of Ophth., 1939, v. 21, Feb., pp. 261-265.

A hollow needle one inch long, with an enlarged sucking disc 4 mm. in diameter on its distal end, is fitted to an accurately ground glass 2-c.c. syringe with a resisting power of seventy pounds of hydraulic pressure. The spring plunger is five sixths the length of the barrel so that the actual displacement is only equal to the amount of air contained in the sucker and the lumen of the needle. Thus when the disc is applied to the lens and the plunger released, the lens adheres because of atmospheric pressure. By varying the pressure of the thumb on the rod, different degrees of tension on the capsule can be produced, and the grip can be changed readily from one part of the capsule to another. If desired, vibration of the capsule can be pro-

duced by merely pressing and releasing the plunger of the instrument. There is no valve. (Photographs.)

J. Hewitt Judd.

Dutt, K. C. **Role of nonviolence in lever-action intracapsular extraction of cataract.** Arch. of Ophth., 1939, v. 21, Jan., pp. 8-29.

This article is a sequel to one previously published in which the scientific principle of the lever action and its technical application to the intracapsular extraction of cataract were described (Amer. Jour. Ophth., 1938, v. 21, p. 707). The stages in the operation are reviewed and an explanation is offered as to why the author considers his method safer, surer, and at the same time simpler than capsulotomy and the other intracapsular methods. This operation allows the principle of nonviolence to be applied to the rotation of even the most stubborn lens with a hyalonavicular fulcrum and a mango-leaf dislocator. J. Hewitt Judd.

Eckardt, R. E., and Johnson, L. V. **Nutritional cataract and relation of galactose to appearance of senile suture line in rats.** Arch. of Ophth., 1939, v. 21, Feb., pp. 315-327.

The production of cataract in albino rats when placed on a diet deficient in riboflavin (vitamin G, or B_2) was obtained in only two out of 23 rats. Inclusion of riboflavin in the diet did not prevent the cataract from progressing to maturity and in one instance did not prevent a cataract from forming in the second eye. The cataract started as an opacity of the fetal nucleus. Keratitis and vascularization of the cornea were more consistent ocular changes than cataract and were improved by addition of riboflavin to the diet; they did not occur in animals kept on the Day diet supplemented with riboflavin. A diet high in lactose produced a senile suture pattern in three weeks in each instance. This was accompanied by peripheral vacuoles as well as by club-shaped riders similar to those seen in coronary cataracts. The senile suture pattern was not observed in any of the rats on the lactose-free diet. When mature cataract appeared, it started as an opacity in the fetal nucleus. Lactose in the diet or injection of galactose caused rapid maturation of the lens as evidenced by the appearance of the senile suture line. Vascularization of the cornea was never observed in the rats on the diet high in lactose.

J. Hewitt Judd.

Euler, H., Hellström, H., Schlenk, F., and Günther, G. **The enzyme system of oxydo-reduction metabolism in lenses.** Graefe's Arch., 1939, v. 140, pt. 1, pp. 116-128.

In the examined lenses (cattle, rats) the oxidation-catalyzers, cytochrome, cytochrome c-oxydase, and diaphorase are absent. Yellow ferment, even if predominantly present, may not play any role as a carrier of hydrogen in the lens. Among the dehydrogenases, succinodehydrogenase is absent. A greater number of cozymase (diphospho-pyridine nucleotide) combined dehydrogenases are identified. In addition, one finds the triphospho-pyridine nucleotide specific dehydrogenase of the hexose monophosphoric acid. The examined lenses are rich in cozymase and also contain triphospho-pyridine nucleotide; cozymase is present in an oxidized and a reduced form. There is thus found in lenses all the necessary enzymatic components for glycolysis, while the respiratory system is imperfect. As has been known for a long time, lenses contain much ascorbic acid and much sulphhydryl combina-

tions which come under consideration as activators, that is as co-enzymes of a still unknown enzyme system of oxydation-reduction. For the opinion that ascorbic acid in the lens is derived from hexoses, a point of support is experimentally obtained. H. D. Lamb.

Fahmy, A. Y. **Experience with the erisiphake of Barraquer.** Bull. Ophth. Soc. Egypt. 1937, v. 30, p. 101.

Preoperative preparations are outlined in detail and the technique of Barraquer's operation is given.

Edna M. Reynolds.

Fischer, F. P. **Aneurin (vitamin B) in the lens.** Ophthalmologica, 1939, v. 96, Jan.-Feb., p. 219.

Vitamin B is present in the lens almost exclusively as co-carboxylase which is effective as a ferment rather than as a vitamin. It causes the decomposition of pyruvic acid. An accumulation of the latter characterizes progressive opacification of the lens and explains the paucity of lactic acid in the cataractous lens.

F. Herbert Haessler.

Fradkin, M. I. **Hemato-ophthalmic barrier in newborn animals.** Viestnik Ophth., 1939, v. 14, pts. 2-3, p. 100.

Experiments on rabbits show that animals attain the normal hemato-ophthalmic barrier after their ninth day. This explains the fact that the progeny of scorbutic guinea pigs are born with lenticular opacities, while to produce cataract in scorbutic animals a disturbance in the hemato-ophthalmic barrier must first be produced.

Ray K. Daily.

Gifford, S. R., and Bellows, J. **Histologic changes in the lens produced by galactose.** Arch. of Ophth., 1939, v. 21, Feb., pp. 346-358.

Lenses were removed from white rats, which had been placed on a diet of 50 percent galactose, one to 32 days after the beginning of the diet. The lenses showed various stages of galactose cataract. These were compared with a series of lenses with naphthalin cataract and a few lenses with senile cataract. Histologic changes were found in lenses which appeared normal in vivo. In galactose cataract the earliest changes involved the cortical fibers near the equator, but growth of new fibers was sufficiently rapid that some relatively normal fibers were always found just beneath the capsule in this region. The capsular epithelium showed changes later. The nucleus remained undamaged to a late stage. Regeneration of new fibers occurred rapidly when a normal diet was resumed. In naphthalin cataract the capsular epithelium and peripheral cortex were involved simultaneously. Rapid swelling of the lens occurred. The nucleus remained intact to a late stage.

J. Hewitt Judd.

Horváth, Béla de. **Cataract extraction with scleral suture.** Szemészet, 1938, v. 1, Dec., p. 22.

Having dissected the conjunctiva from the limbus up to the insertion of the superior rectus muscle, the author grasps the tendon of this muscle and inserts a needle from above downward between the fibers of the tendon and of the scleral tissue, so that the point of the needle shall emerge 4 mm. in front of the corneal margin. He makes the corneal section in the usual way, but at 3 mm. distance from the limbus turns the knife at an angle so as to cut a scleral flap. The lens is extracted in the usual way, and then the sutures are inserted into the scleral flap and the wound is closed. The author claims

superiority of this method in preventing opening of the wound and also iris prolapse. Out of 51 operations performed in this way, iris prolapse occurred in two instances only, these being cases in which catgut was used instead of hair as suture material.

R. Grunfeld.

Kopp, I. **Intracapsular cataract extraction.** Viestnik Opht., 1939, v. 14, pt. 1, p. 79.

An analysis of 120 operations leads to the following conclusions: (1) The operation is indicated in immature, nuclear, and myopic cataract. (2) Extraction with iridectomy and without tumbling of the lens is preferable. (3) The operation is not free from postoperative complications such as hyphemia, iritis, late restoration of the anterior chamber, and excessive astigmatism.

Ray K. Daily.

Lénárd, Imre. **Suture for wound closure in cataract extraction.** Szemészet, 1938, v. 1, Dec., p. 29.

After dissecting the conjunctival flap and undermining it for a distance, the author makes a cut parallel with the limbus through the superficial layers of the sclera. He undermines this incision toward the cornea and toward the sclera. A perpendicular cut makes the flaps mobile, so that they can be grasped with forceps without traumatizing the parenchyma proper. They are united by mattress sutures after the extraction, which the author performs without iridectomy. R. Grunfeld.

Liebermann, Leo de. **Conjunctival suture in cataract extraction.** Szemészet, 1938, v. 1, Dec., p. 46.

The author enumerates a few technical details which he used with great advantage in cataract extractions with conjunctival flap after the method of Blaskovics. R. Grunfeld.

Lindberg, J. G. **Eight cases of dinitrophenol cataract, two of which had punctate stationary lenticular opacities, not described hitherto.** Acta Ophth., 1938, v. 16, pt. 4, p. 556.

In addition to six cases of typical dinitrophenol cataract, the author describes two cases with stationary lenticular opacities at the equator, without impairment of vision.

Ray K. Daily.

Måhlen, Sven. **Dinitrophenol cataract.** Acta Ophth., 1938, v. 16, pt. 4, p. 563.

A review of the literature and a report of seven cases. Ray K. Daily.

Müller, H. K. **The carbohydrate metabolism of the lens in acute naphthalin poisoning.** Graefe's Arch., 1939, v. 140, pt. 1, pp. 171-190.

In acute naphthalin poisoning, the sugar content of the lens diminishes. This does not result from a diminution of sugar in the aqueous humor, but from disturbances of intermediate sugar metabolism in the lens and from the difficulty with which sugar enters the lens. The naphthalin poisoning causes considerable increase of the lactic acid in the lens, blood, and aqueous humor. Indications exist that the release of sugar, glutathione, and ascorbic acid also becomes more difficult.

H. D. Lamb.

Oberhoff, Kurt. **Congenital cataract with formation of crystals.** Klin. M. f. Augenh., 1939, v. 102, Feb., p. 238.

A machinist aged 29 years presented a very rare congenital, dominantly hereditary, bilateral cataract with conical and nodular amorphous opacities containing crystals, which had no rela-

tion to the anatomic structure of the lens. The patient had had poor sight since early life. A sister who had died from tuberculosis at the age of seventeen years had shown at the age of ten years glistening opacities in both lenses, probably of the same type.

C. Zimmermann.

Reis, Julian. **The significance of ascorbic acid in the chemical metabolism of the lens.** Klinika Oczna, 1938, v. 16, pt. 6, p. 760.

A review of the literature.

Ray K. Daily.

Salit, P. W. **Nitrogen content of cataractous and sclerosed human lenses.** Acta Ophth., 1939, v. 17, pt. 1, p. 81.

The analysis of 167 cataractous and sclerosed human lenses shows that there is a considerable loss in protein in the senile pathologic lens, and that the loss is proportionate to the degree of pathology in the lens. The loss involves chiefly the soluble crystallins; the insoluble albuminoids left behind impart to the nucleus, in which they predominate, an increased rigidity and hardness. Ray K. Daily.

Salit, P. W. **The reaction and buffer activity of normal ox lenses.** Amer. Jour. Ophth., 1939, v. 22, April, pp. 413-415.

Sédan, Jean. **Equatorial trepanation of the sclera as a prophylactic for expulsive hemorrhage.** Ophthalmologica, 1939, v. 96, Jan.-Feb., p. 201.

In two patients, in each of whom one eye had been lost from expulsive hemorrhage, the second eye was successfully operated upon for cataract. In these eyes a preliminary equatorial trepanation was done two weeks before cataract extraction. Despite copious hemorrhage from the subconjunctival injections of novocaine for anesthesia before trepanation, no expulsive hemorrhage occurred when the eye was opened two weeks later. Sédan prefers this procedure to posterior sclerotomy immediately before cataract extraction.

F. Herbert Haessler.

Sédan, Jean. **Two cases of dinitrophenol cataract.** Ann. d'Ocul., 1939, v. 176, March, pp. 191-197.

Two typical cases of rapidly developing dinitrophenol cataract are reported. John M. McLean.

Szily, Aurel. **The Doyne Memorial Lecture. The contribution of pathological examinations to the elucidation of the problems of cataract.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, pp. 595-660.

The author gives an extensive histologic report on his study as to the development of cataract. As to the morphologic basis of certain malformations of the lens, fundamental importance resides in the proof that divergence from normal morphology is primary and disintegration of the lens substance secondary in all cases of genuine idiokinetic malformation of the lens. Biochemistry has revealed that the first stimulus to cataractous change is initiated by chemical processes within the lens itself. (Illustrations.)

Beulah Cushman.

Szymanski, Janusz. **The application of the Smith and Pagenstecher principles to subconjunctival extraction of the lens.** Klinika Oczna, 1938, v. 16, pt. 6, p. 752.

The technique consists in section with conjunctival bridge, introduction of sutures on each side of the bridge, pressure with a hook according to

Smith from below and with a Weber loop introduced under the bridge from above, and introduction of the loop behind the cataract as soon as its upper border presents. (Illustrations.)

Ray K. Daily.

Van Lint. **Extraction of secondary cataract after double incision of the cornea.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 463-467. (See Amer. Jour. Ophth., 1939, v. 22, Feb., p. 230.)

Vila Ortiz. **Experimental action of galactose on the lens of the dog.** Arch. de Oft. de Buenos Aires, 1938, v. 13, Sept., p. 467.

This article is an experimental study on the calcium content of the lens of the dog with respect to the effect of the administration of galactose. The essayist concludes that the calcium content of the lens of the dog is extremely variable. Galactose administered by intraocular or intravenous injection has no appreciable effect upon the calcium content of dogs' lenses. Oral administration of galactose, however, produces significant changes. The calcemia produced by oral administration of galactose varies between figures which can be considered normal. There are no histopathologic changes in the parathyroid glands of animals which have ingested galactose.

Edward P. Burch.

Wagner, H. **Remarks on Bakker's criticism regarding the question of the infrared cataract.** Graefe's Arch., 1939, v. 140, pt. 1, pp. 191-192.

The author criticizes the contention of Bakker (see Amer. Jour. Ophth., 1939, v. 22, p. 462) following the similar previous one of Goldmann, that there exists a heat cataract rather than an infrared cataract, as Vogt's clinic claims. He indicates that neither Goldmann nor Bakker had carefully read the results reported from Vogt's clinic. In addition, Goldmann himself had stated that his argument failed in that lens opacities occurred in albino rabbits after infrared radiation. Vogt's assistants have been able to produce thick posterior shell cataracts in albino rabbits with penetrating infrared rays.

H. D. Lamb.

10

RETINA AND VITREOUS

Abramowicz, I. **Marking of perimetrically determined corneal meridians.** Klinika Oczna, 1938, v. 16, pt. 6, p. 758.

A device which consists of a white disc with a movable pointer attached at the center. (Illustration.)

Ray K. Daily.

Agatston, S. A. **Report of two cases of unilateral retinitis pigmentosa.** Amer. Jour. Ophth., 1939, v. 22, April, pp. 420-421.

Anker, Morten. **Three cases of tuberous cerebral sclerosis with Van der Hoeve's phacoma retinae.** Acta Ophth., 1938, v. 16, pt. 4, p. 454.

A review of the literature and detailed case reports. The eye symptoms in the author's cases comprised veiling of the papilla, white stripes along the retinal vessels, raspberry-like white tumors, and small flat slightly projecting white foci in addition to the usual choroidal atrophic areas. Because idiocy and epilepsy are frequent symptoms of tuberous sclerosis, the author urges ophthalmoscopic examination of idiots and epileptics; and because retinal phacomata may be the only symptom of cerebral sclerosis he advises ophthal-

moscopic study of the entire family of a patient with cerebral sclerosis. (Illustrations.) Ray K. Daily.

Bogdanovich, I. I. **Hole detachment of the vitreous.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 52.

A review of the literature, and a report of four cases. In the two cases which the author was able to observe for some time retinal detachment did not occur. (Illustration.)

Ray K. Daily.

Bonnet, Paul. **Angioid streaks of the retina, etc. etc.** Bull. Soc. Franç. d'Opht., 1938, v. 5, pp. 516-520.

Pictures of the fundi of two eyes are described, in which there were angioid streaks, macular degeneration, pigment disturbance, and choroidal atrophy, in a patient with pseudoxanthoma of the skin. Clarence W. Rainey.

Bonnet, P., Dechaume, J., and Blanc, E. **Cirsoid aneurysm of the retina, its relation to cirsoid aneurysm of the face and cerebellum.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 521-524.

Pictures of two fundi are reproduced, showing aneurysm of the retinal vessels. The authors recommend that aneurysm elsewhere be searched for by neurologic examination and X ray, in all cases accidentally encountered by ophthalmoscopic examination.

Clarence W. Rainey.

Bozzoli. **A simple method for the localization of the tear in retinal detachment.** Boll. d'Ocul., 1938, v. 17, Aug., pp. 683-684.

The method is based on the fact that the combination of two complementary lights gives a white light. While the examiner explores the fundus with an ophthalmoscope furnished with red light, an assistant transilluminates the sclera with a green light. The exact place of the tear is determined where the white light manifests itself.

M. Lombardo.

Cassady, J. V. **Congenital cyst of the vitreous.** Arch. of Ophth., 1939, v. 21, Jan., pp. 45-50.

The author reviews the literature and reports the case of a young lady aged 25 years, in whom a cyst in the vitreous was discovered accidentally. The presence of a prepapillary membrane, the lack of pigment, and the location of the cyst in the center of the vitreous suggest the primary vitreous as the site of origin of the cyst as opposed to the theory previously advanced, that such cysts probably originate from a degenerative adenomatous cyst of the ciliary processes. The cyst is shown in a fundus photograph and a colored plate. J. Hewitt Judd.

Cassuto, Nathan. **The behavior of the retinal arterial pressure after bloodletting.** Boll. d'Ocul., 1938, v. 17, Aug., pp. 635-644.

The general and retinal blood pressures were tested in nine patients before and after bloodletting with the idea of finding whether a mechanism regulating the cephalic arterial pressure exists. It was found that both general and retinal diastolic pressures fell, but that there was no direct relation between the two amounts of fall. No uniform values were obtained relating the systolic and diastolic general and retinal pressures to the withdrawal of blood, and no separate mechanism for regulating the cephalic arterial pressure was found, the pressure here merely following the behavior of the general pressure. (Bibliography.)

M. Lombardo.

Coppez, H., and Fritz, A. **Some remarks upon thrombosis of the central vein of the retina..** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 525-530.

In this communication the authors give a concrete demonstration of the important clinical data which must be gathered to utilize their plan of examination of a patient with thrombosis of the retinal vein. Examinations of blood pressure and of arterial and venous pressures in the eye by the method of Bailliart are the basis of the authors' argument. An idea of the proper therapeutic methods is thereby gained.

Clarence W. Rainey.

Cusick, P. L., and Herrell, W. E. **Retinal arteriolar changes as part of an induced general vasospastic reaction; effect of tobacco and cold.** Arch. of Ophth., 1939, v. 21, Jan., pp. 111-117.

A reduction in the caliber of the retinal arterioles was found after smoking in five patients with an idiosyncrasy to tobacco and in 20 out of 25 patients undergoing the cold pressor test. An average rise in intraocular tension of 2 mm. of mercury was noted for the patients who showed a vasospastic reaction from smoking. The narrowing of the caliber is apparently uniform throughout the course of any individual arteriole but is not present equally in all arterioles. The character of the narrowing suggests that it is due to increased vasomotor tonus rather than to active angiospasm. The almost constant association of a transitory reduction in caliber of the retinal arterioles with a rise in systemic blood pressure accompanying the general vasopressor action of cold and tobacco suggests that the generalized narrowing of the retinal arterioles observed ophthalmoscopically in many cases of hypertensive disease is due primarily to active vasoconstriction or increased vasomotor tonus rather than to actual structural change in the walls of the vessels.

J. Hewitt Judd.

Franceschetti, M. A. **Myelinated retinal fibers and disorders of the head.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 573-577.

The authors think that myelinated retinal-nerve fibers indicate a pathologic constitutional state affecting the central nervous system, and they would place the condition in a group containing keratoconus, heterochromia, congenital cataract, zonular cataract, and coloboma. Clarence W. Rainey.

Fritz. **The speed of propagation of the blood in the retinal vessels.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 509-515.

Although it is impossible to ascertain the speed of propagation of the blood in an absolute manner, it is possible to ascertain the presence in an eye of certain conditions that indicate increased or diminished speed of flow. When the retinal vessels have a normal caliber of 0.1 mm., and the column of blood in the vein becomes fragmented when the external pressure on the globe amounts to seven tenths of the pressure required to stop the flow of blood in the artery, the condition of the circulation in the retinal vessels is normal. A marked difference in arterial and venous pressures in the eye, together with absence of venous pulsation and a pale appearance of the optic-nerve head, indicate abnormal rapidity of the blood stream in the capillaries, while the opposite conditions indicate slow speed of the blood stream. Clinically, slackened speed favors formation of thrombus. Clarence W. Rainey.

Gifford, S. R., and Marquardt, G. **Central angiospastic retinopathy.** Arch. of Ophth., 1939, v. 21, Feb., pp. 211-228.

The authors review the literature and present eight cases of a type of central retinopathy which affects young or middle-aged persons, especially men, with little or no increase in general blood pressure. Special examinations revealed definite signs of peripheral vascular spasm which is the guide to diagnosis and treatment. Reasons are given for believing that this and a group of similar conditions described under various names are due to spasm of the smaller retinal arterioles or capillaries, with resulting ischemia and edema of the retina, especially in its macular portion. The cases reported are divided into two groups; the first gives a typical picture of central retinopathy without involvement of the larger retinal vessels and the second, with involvement of the larger vessels.

J. Hewitt Judd.

Grönvall, H. **Fundus changes and ocular disturbances in migraine.** Acta Ophth., 1939, v. 16, pt. 4, p. 602.

A review of the literature and a report of a case of migraine in a woman eighteen years old. With one attack she had scintillations, dizziness, and loss of vision in the right eye. Recovery of vision was rapid, except for the upper nasal quadrant, where loss of vision persisted. On ophthalmoscopic examination the following day, the lower half of the retina was edematous, the arteries were constricted, and one branch entirely obliterated. The diagnosis was migraine with angiospasm.

Ray K. Daily.

Hanum, Steen. **Diabetic retinitis.** Acta Ophth., 1939, Supplement 16.

The summary of this comprehensive manuscript is based on study of 966 diabetic patients, of whom 195 had retinal changes. The greatest incidence of diabetes and retinitis is in the fifth and sixth decades of life. Diabetic retinitis occurs more frequently in women. The frequency of retinitis rises with the duration of the diabetes. There is no relation between the gravity of the diabetes and the incidence of retinitis, but the latter is more frequent in untreated or inadequately treated diabetics. The fundus appearance of diabetic retinitis may be exudative, circinoid, hemorrhagic, or proliferative in type. From the study of twelve cases the author believes that a reduction in the ascorbic-acid content of the blood is an etiologic factor in proliferative retinitis. Careful study fails to show that diabetic retinitis is dependent on renal changes, hypertension, or disturbances in blood chemistry. Retinal hemorrhages appearing after the institution of insulin treatment are attributed to changes in intraocular tension. Except for the proliferating type of retinitis, the prognosis for vision is good. A mathematical calculation of the mortality rate of diabetics with and without retinitis shows that it is 2.7 times higher for men, and 1.6 times higher for women with than without retinitis.

Ray K. Daily.

Jensen, J. P. **Retinal changes after experimental gastrectomy in dogs.** Acta Ophth., 1938, v. 16, pt. 4, p. 649.

After resection of the ventricle alone, or of the ventricle and of Brunner glands from the duodenum, young dogs developed a clinical picture similar to pellagra and died in spite of sufficient nutrition. In many of these dogs there developed a degeneration of the ganglion and bipolar cells in the retina, with

proliferation of the glial tissue. Vitamins were ineffective, but administration of gastric juice was followed by improvement. These findings question the assumption that lack of vitamin C is responsible for the ocular symptoms of pellagra, and they suggest that a disturbance of gastric secretions may be the etiologic factor. (Illustrations.)

Ray K. Daily.

Jensen, V. A. **Anastomosis formation after embolism of the central retinal artery.** Acta Ophth., 1938, v. 16, pt. 4, p. 485.

A report of three cases. These arterial anastomoses may take place within the retinal circulation if the embolism lodges in a branch of the central artery, or they may develop between the retinal and ciliary arterial systems if the embolism lodges in the main trunk of the central artery. From his own cases and from a review of the literature the author concludes that the probability of an anastomosis developing is greatest in cases where the initial vascular obstruction is incomplete, so that the capillary communications get time to dilate and gradually take charge of the blood supply. In such cases the gradually enlarging vessels become visible in the fundus after a period varying from ten days to three weeks. In complete sudden embolism of the main trunk the capillary communications are insufficient to keep up the circulation and no anastomosis develops. (Illustrations.)

Ray K. Daily.

Johnstone, I. L. **Maculo-cerebral degeneration (Batten-Mayou disease or juvenile amaurotic idiocy).** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 769.

A report of two sisters aged thirteen and eleven years respectively with history and findings of cerebral degeneration and macular changes which had begun at the ages of nine and seven years respectively. In four years time there was optic atrophy and epileptiform convulsions. The macular lesion gradually extended.

Beulah Cushman.

Kay, B. **Cysticercus cellulosae in the vitreous.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 794.

A cysticercus is reported in a 42-year-old laborer whose vision suddenly became blurred. The dense white nonvascular cyst was visible in the vitreous, and at times the scolex was seen in its movements. The cyst remained visible with movement of the scolex for the following two years. The surrounding vitreous was degenerated and there were fine strands attached to the cyst wall. Beulah Cushman.

Kovarskaja, S. S., and Sorkina, S. I. **Tuberculous detachment of the retina.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 74.

A report of five cases in which the diagnosis is based on the youth of the patients, subretinal striae, infiltrated foci in the fundus, and tortuosity of the vessels. In such cases general treatment should precede surgical intervention. Ray K. Daily.

Lijo Pavia, J. **Tears of the retina, presence in the vitreous of the retinal hole or flap.** Rev. Oto-Neuro-Oft., 1938, v. 13, Oct., p. 230.

Clinical observations by the author on the mechanism of production of retinal holes and tears and their influence on the pathogenesis of retinal detachment. Edward P. Burch.

Lisch, Carl. **Vasopathy and eye.** Klin. M. f. Augenh., 1939, v. 102, Feb., p. 228.

Lisch's microscopic investigations showed pathologic changes of the capillaries in all patients with vasopathy. Fifty-one percent of the patients had hemorrhages in the nail grooves, but none showed retinal periphlebitis. The author thinks that vasopathy, especially Buerger's disease, does not play the determining role in the development of retinal periphlebitis, as asserted by Marchesani; and that vasopathy is relatively rarely the cause of periphlebitic changes in the retina.

C. Zimmermann.

Niccol, W. **A family with bilateral developmental defects at the macula.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 763.

A boy aged four and his sister aged three years had similar macular defects with evident excavation, bounded by a broad bluish-white border like a rolled rim, not measurably projecting. In spite of these defects there was no nystagmus or sign of difficulty in seeing. The younger child had a left convergence and it was because of this condition that the child was brought for examination.

Beulah Cushman.

Nordlöw, W. **A case of spontaneous retinal detachment in identical twins.** Acta Ophth., 1938, v. 16, pt. 4, p. 579.

A report of retinal detachment in the right eyes of a pair of twins, myopes, 41 years old. Atrophic foci were found in the two unaffected eyes. The detachments in the two sisters occurred one year apart. In one a satisfactory result was obtained with electrodiathermy. In the other, the retina remained detached in spite of repeated coagulations. (Illustrations.) Ray K. Daily.

Perera, C. A. **Congenital grouped pigmentation of the retina.** Arch. of Ophth., 1939, v. 21, Jan., pp. 108-110.

The clinical picture of this entity is described and illustrated in a drawing showing an extensive involvement of the fundus in one eye of a four-year-old Jewish boy. The fundus of the other eye and the fundi of his parents were normal. J. Hewitt Judd.

Ploman, K. G. **Heparin treatment of thrombosis of the central retinal vein.** Acta Ophth., 1938, v. 16, pt. 4, p. 502.

The author used a 5-percent heparin solution intravenously. The material consisted of two cases of thrombosis of the central retinal vein and six cases of thrombosis of one of its branches. Of the two cases of central thrombosis one recovered completely and the second showed rapid improvement. Of the six cases of thrombosis of a branch, five showed an average improvement of 0.3 in visual acuity. One case was unimproved. Ray K. Daily.

Post, L. T. **Thermophore treatment of retinal detachment.** Southern Med. Jour. 1939, v. 32, March, pp. 273-278.

The thermophore method of treatment of retinal detachment is described, and seven cases successfully so treated are reported in detail. Advantages of this method over electrocoagulation are discussed. (Illustrations.)

George A. Filmer.

Rosengren Bengt. **Results of treatment of retinal detachment with diathermy and injection of air into the vitreous.** Acta Ophth., 1939, v. 16, pt. 4, p. 573.

A tabulated report of 26 cases with satisfactory results. Ray K. Daily.

Samuels, Bernard. **Pathologic picture of retinal detachment.** Arch. of Ophth., 1939, v. 21, Feb., pp. 273-314.

This survey is based on the study of 41 anatomic specimens in an effort to determine the etiologic importance of lacerations, to differentiate between recent and old changes in retinal detachment, to obtain information as to degenerative changes in the retina, and to search for the causes of the development of iritis with glaucoma in cases of detachment of long standing. Under the causes of detachment, the author discusses Gonin's theory of traction of the detached vitreous, Vogt's theory of cystic degeneration, Hanssen's theory of stretching of the retina in myopia, the importance of congenital weakness as a factor in traumatic detachment, Weve's theory of detachment caused by retinal cyst, and choroidal transudates in those detachments without lacerations. Under primary anatomic changes in the retina he discusses the localization of holes and lacerations, changes in the vitreous, relation of vitreous to the margins of retinal holes, inversion of the lips of a laceration, cystic degeneration near and far from a hole, large cysts of the retina, and stretching of the retina. Under secondary anatomic changes caused by the age of the detachment and by the complications of inflammation and glaucoma, he discusses the changes in the retina, such as degeneration and atrophy, changes in the blood vessels, folds, changes in the apertures, and splitting of the retina. He also discusses the changes found in the vitreous, ciliary body, iris, lens, choroid, and papilla. The glaucoma which occurs is thought to be secondary to iritis which in turn is probably produced by severe inflammation caused by the absorption of the subretinal fluid. It is pointed out that an albuminous fluid retained in a cavity over a long period in all probability changes its quality and becomes irritating to neighboring tissues. This is not true of the primary fluid of recent detachments, which in cases with a hole certainly originates from the vitreous, and in those without an aperture probably comes from the retina.

J. Hewitt Judd.

Sobhy Bey, M. **Operative treatment of detachment of retina.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 110.

The simplest type of operation for retinal detachment is just as satisfactory as the more complicated types. All the difficulty of the operation lies in localization of retinal tears by the ophthalmoscope during operation. The Coccius ophthalmoscope is recommended.

Edna M. Reynolds.

Tansley, Katharine. **Night blindness.** Brit. Jour. Ophth., 1939, v. 23, March, pp. 161-170.

The purpose of this paper is to review what is actually known of night blindness and how it may be improved or cured through vitamin-A therapy. The author discounts the work that has been done by clinicians and vitamin workers without previous training in this important experimental field. Some general criticisms of present methods are given at the conclusion of the article. The author states that the condition of night blindness is simply a failure in dark adaptation, and that the connection between night blindness and vitamin-A deficiency is now so widely accepted that it is not necessary to go into the literature for findings. It is the feeling of the author that variations from the normal dark adaptation curve can be used to diagnose vitamin-A deficiency provided experienced ob-

servers, proper apparatus, and a sufficiently long period of dark adaptation are employed. Recent methods test too many patients in too short a period of time to make the findings of worth. (References.) D. F. Harbridge.

Vannas, Mauno. **The localization of ruptures and foreign bodies in the fundus.** Acta Ophth., 1938, v. 16, pt. 4, p. 588.

The author's method consists in introducing a sharp needle anteriorly into the eyeball, guiding it ophthalmoscopically through the eyeball, and making a counterpuncture through the tear. The needle then remains in place until the area around it is coagulated. (Illustration.) Ray K. Daily.

Weve, H. J. M., and Fischer, F. P. **The acetylcholinesterase content of the subretinal fluid in retinal detachments with tears.** Ophthalmologica, 1939, v. 96, March, p. 348.

In retinal detachment due to rupture, the subretinal fluid always contains acetylcholinesterase. This substance is normally present in retina, choroid, and vitreous, but not in aqueous. Early in the detachment, the ferment comes from the retina and choroid and later only from the vitreous. The significance of this finding for the pathogenesis of retinal detachment is discussed. The only ferment that occurs in the aqueous constantly, namely, proteinase E, is not found in the subretinal fluid. F. Herbert Haessler.

11

OPTIC NERVE AND TOXIC AMBLYOPIAS

Cibis, Paul. **The etiology and frequency relations of retrobulbar neuritis.** Klin. M. f. Augenh., 1939, v. 102, Feb., p. 205.

The author emphasizes the difficulties of the etiologic conception of retrobulbar neuritis, on account of the possibility of association of several causes and the experience that in the presence of any given etiologic factor a sclerotic affection of the optic nerve can never be excluded, as isolated disease of the optic nerve in multiple sclerosis may precede by years its other symptoms. The same is true as to disseminated encephalomyelitis, which has the same tendency to remission. The primary cause of multiple sclerosis has not been ascertained. With regard to these questions 189 cases were examined which had attended the Heidelberg eye clinic between January 1, 1920, and December 31, 1937. Disseminated sclerosis was the probable cause in 40 percent of retrobulbar neuritis, in 60 percent of the acute cases, and in about 70 percent of the acute forms after exclusion of all cases in which other causes were probable. In 55 cases no etiologic factor was proved. C. Zimmermann.

Dymling, Otto. **Contribution to the clinic of optic neuritis.** Acta Ophth., 1938, v. 16, pt. 4, p. 547.

A tabulated report of blood studies in 27 cases of retrobulbar neuritis. Most of the cases had a lymphocytosis with normal or slightly raised white count. The author believes that the lymphocytosis indicates vitamin-B deficiency, and thus opens a new path in the search for the etiology of retrobulbar neuritis. Ray K. Daily.

Evans, J. J., and Evans, P. J. **Ocular changes associated with nevus flammeus.** Brit. Jour. Ophth., 1939, v. 23, Feb., pp. 95-105.

Described herein are two cases of optic atrophy and other changes associated with nevus flammeus. Defective

nutrition resulting from an abnormal vascular supply induces optic atrophy which is neither dependent upon nor secondary to a rise of intraocular tension. In one case there were varying periods of increased tension, while in the other no increase in intraocular tension was apparent in examinations covering a thirteen-year period. A rare opportunity for observing a hemangioma of the choroid and of the course of entry of this tissue into the globe was afforded. Intracranial vascular abnormalities and irradiation cataract were observed in the first case presented. (Figures, bibliography.) D. F. Harbridge.

Gorse and Calmettes. **Oxycephaly and optic atrophy.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 578-586.

The authors describe a case of oxycephaly in an adult male. There was upward enlongation with tapering of the skull, first noticed at birth. At the age of seventeen years the patient began to have headache, with loss of vision due to optic atrophy of the simple type. He also suffered personality changes and had a tendency to fall. There was symmetric, conical enlargement of the skull, produced by a thin-walled hypertrophy. There was simple bilateral optic atrophy. In the authors' opinion the optic atrophy was the result of increased intracranial pressure and papillary stasis.

Clarence W. Rainey.

Lauber, Hans. **The relationship between intracranial and retinal blood pressure and intraocular tension; the treatment of tabetic optic atrophy.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 661.

Measurement of intracranial pressure by use of the ophthalmodynamometer has been stated as the pressure in the vein at the moment of the first pulsations, multiplied by ten. Blood pressure in the ocular arteries, capillaries, and veins must be higher than the intraocular tension. In prognosis of glaucoma the level of blood pressure is very important, the lower the blood pressure, the more rapid the progression of glaucoma.

The author and Sobanski studied conditions of vascular pressure in tabetics and found that tabetic patients with progressing optic atrophy showed low blood pressure. Tabetic patients with high blood pressure were free from optic atrophy. In tabes, following severe hemorrhage and retinitis pigmentosa, lability of the cardiovascular system with tendency toward hypotonia is found. The author emphasizes a general treatment which would elevate the general arterial tension or lower the intraocular tension. The results of treating 75 patients with tabetic atrophy are given; 55 eyes showed improvement, 43 remained unaltered, 33 became worse. The general condition also improved with the higher pressure.

The author concludes that tabetic optic atrophy must be considered with the question of the primary lesions in glaucoma because one of the principal factors leading to functional and anatomic changes is disproportion between blood pressure and intraocular tension. Beulah Cushman.

Mamedov, B. **Decortication of the common and internal carotid arteries in the therapy of optic atrophy.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 108.

A report of four cases shows that except in tabetic optic atrophy the operation is helpful; it is more effective in the young, and in retinitis pigmentosa should be supplemented by vitamin therapy. Ray K. Daily.

Orzalesi, Francesco. **A prevalently retrobulbar optic neuritis of obscure etiology in the course of a psoriasis.** Boll. d'Ocul., 1938, v. 17, May, pp. 350-369.

The history is given of a man of 22 years who about four years before had become affected by psoriasis of the extensor surface of the limbs which gradually became general as a form of psoriatic erythrodermia. Suddenly the vision failed to 5/30 in O.D. and 2/30 in O.S., with a central scotoma for form and colors. The peripheral fields were of normal limits and the fundi were negative with the exception of a slight peripapillary edema. The etiologic-pathogenetic factors of the optic neuritis are enumerated and discussed, and are eliminated in this case. The conclusion is reached that a relation between the psoriasis and the optic neuritis is not to be excluded. (Bibliography.)

M. Lombardo.

Popov, M. Z. **Worm's operation in opticochiasmal arachnoiditis.** Viestnik Opht., 1939, v. 14, pt. 1, p. 66.

An 18-year-old woman following an attack of grippe developed exophthalmos, ptosis, complete ophthalmoplegia, and loss of vision in the left eye, and a right optic neuritis with vision limited to light perception. Drainage of the ethmoidal and sphenoidal sinuses was ineffective. An exploratory Krönlein-Golowin operation on the left eye revealed a diffuse edema of the orbital tissues and marked swelling of the optic nerve. In view of negative neurologic findings the conclusion was that the nerves were strangulated in the optic canal. In the hope of saving some vision in the right eye, the author performed a decompression of the right optic nerve, removing the inner wall of the optic canal. There was immediate improvement in the fundus picture and vision rose to 0.05. (Illustrations.)

Ray K. Daily.

Scheyhing, Hans. **Optic neuritis with transient blindness and meningo-encephalitis after vaccination.** Klin. M. f. Augenh., 1939, v. 102, Feb., p. 223.

A child of fourteen months became blind fourteen days after vaccination. It showed bilateral optic neuritis and opisthotonos, and lumbar puncture revealed high pressure in the sterile fluid. A diagnosis of encephalitis with meningitis was made and the child was placed in the hospital. Intramuscular injections of 28 c.c. of convalescent blood from a vaccinated individual, and daily lumbar puncture, were followed by recovery. The literature is quoted to show that out of 89 patients with postvaccinal encephalitis 31 died.

C. Zimmermann.

Sobanski, Janusz. **Gray discoloration of the optic nerve.** Klinika Oczna, 1938, v. 16, pt. 6, p. 749.

A description of a congenital abnormality which consisted of gray discoloration of the optic nerve and a broad connective-tissue ring surrounding it. (Illustrations.) Ray K. Daily.

Sourdille, G. P. **Abnormal forms of optic neuritis.** Bull. Soc. Franç. d'Opht., 1938, v. 51. pp. 569-572.

Two cases of loss of vision during adolescence were thought to be due to hypertrophy of the hypophysis.

Clarence W. Rainey.

Van Heuven, J. A. **Papilledema.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 549.

After extensive experimental work the author agrees with Bauermann that absence of venous pulsations on the op-

tic disc is an important finding in suspected increase of intracranial pressure. He found, as have others, that in most cases brain tumors are associated with general edema of the central nervous system (even 10-percent increase in water content producing the edema), but it was not found in all cases. This fact might account for the lack of edema with pituitary lesions. The writer concludes that the cause of papilledema has not yet been completely explained. Beulah Cushman.

Vilenkina, A. I. **Hypotony in tabetic atrophy of the optic disc.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 69.

Four cases illustrate the improvement obtained through the lowering of intraocular tension in early cases of tabetic optic atrophy.

Ray K. Daily.

Wieczorek, Antoni. **Retrobulbar neuritis.** Klinika Oczna, 1939 v. 17, pt. 1, p. 1-97.

This exhaustive monograph on the subject thoroughly reviews the literature and closes with a very complete bibliography. Ray K. Daily.

12

VISUAL TRACTS AND CENTERS

Bush, F., and Möller, H. U. **Ophthalmologic symptoms in intracranial tumors, with special reference to visual acuity.** Acta Ophth., 1939, v. 16, pt. 4, p. 453.

This is a brief summary of a survey of 352 cases. Papilledema was present in 70 percent of them. In 25 percent the edema was greater on the side of the tumor. There were 96 cases with visual-field defects, and in 25 percent of these the defects were hemianopsic in type. Disturbances in pupillary reactions occurred in 19 percent of the cases, and disturbances in ocular motility in 12 percent. This survey indicates that the prognosis for vision in cases of choked disc is good until secondary atrophy sets in. The author urges operation for pituitary tumor at the first appearance of eye symptoms. Ray K. Daily.

Kenel, Ch. **Five cases of traumatic opticochiasmatic arachnoiditis.** Ophthalmologica, 1939, v. 96, March, p. 336.

In four patients who had suffered severe frontal injury followed by headache, insomnia, dizziness, some diminution of central vision, great bilateral peripheral contraction of the fields, and increased pressure in the retinal arteries, a diagnosis of opticochiasmatic arachnoiditis was made. The diagnosis was confirmed at operation when a fibrous or fibrinous membrane was removed. The operation was followed by improvement, especially of the fields, but eventually all the symptoms recurred. In a fifth patient with similar manifestations, no operation was done.

F. Herbert Haessler.

Lundberg, Åke. **Amaurosis accompanying a radiographically visible aneurysm of the internal carotid artery.** Acta Ophth., 1939, v. 17, pt. 1, p. 69.

A report of a case in a 64-year-old man with arteriosclerosis and cerebral hemorrhage, diagnosed by X ray and verified by autopsy. Six years after the development of right homonymous hemianopsia vision suddenly became cloudy, and in five months the patient was blind. The radiograph showed an aneurysm to the left of the sella turcica. At autopsy both internal carotids were found rigid, because of calcification, and irregular in caliber. To the left of and close to the chiasma there was a small aneurysm, without hemorrhage. Ray K. Daily.

Olivecrona, H. **The significance of eye symptoms in the diagnosis of brain tumors.** Acta Ophth., 1938, v. 16, pt. 4, p. 431.

A comprehensive review of the ocular symptoms associated with intracranial lesions. Ray K. Daily.

Osterberg, G. **Traumatic bitemporal hemianopsia caused by sagittal rupture of the chiasm.** Acta Ophth., 1938, v. 16, pt. 4, p. 466.

A report of two cases and a review of the literature. To explain the pathogenesis of this injury the author stretched the optic chiasm, twelve hours after death, by means of two Prince forceps, varying the force and rapidity of the pull. The microscopic sections of this tissue show numerous minute rhomboid and linear tears placed in or close to the median plane of the chiasm. These findings convince the author that the median plane of the chiasm is its most vulnerable point, and that such tears can explain total interruption of all crossed chiasmal pathways. (Illustrations.) Ray K. Daily.

Rönne, Herring. **Focal diagnosis of the visual path.** Acta Ophth., 1938, v. 16, pt. 4, p. 446.

A discussion of the diagnostic significance of the various hemianopsias. Ray K. Daily.

Scardapane, Florindo. **Severe amblyopia consecutive to enterorrhagia in a patient affected by hemophilia.** Boll. d'Ocul., 1938, v. 17, Aug., pp. 674-682.

A man of 38 years after a profuse hemorrhage had shown the following symptoms: The right eye was proptosed, with vision reduced to counting of fingers. The visual field was contracted nasally and below including part of the central zone. The vision of the left eye was normal, but the visual field showed loss of field below and temporally. Both discs were pale with contracted arteries. X-ray examination of the skull showed on the right a rounded opacity about 20 mm. in diameter in the middle cranial fossa. Seven years later these symptoms were still present with the exception of the exophthalmos. Scardapane is inclined to think that an important factor in the production of the descending optic atrophy was the compression of the optic pathways by a cranial hemorrhage which had gradually resorbed. (Bibliography, 2 figures.)

M. Lombardo.

Spotnitz, H. **Subjective foveal hemianopsia during dark adaptation in patients with tumors of a temporal lobe.** Bull. Neur. Inst. New York, 1938, v. 7, Sept., p. 170.

Two hundred cases of suspected intracranial disease were examined. Transient subjective foveal hemianopsia was noted in three of the cases during a study of foveal dark adaptation. None of the patients had foveal hemianopsia upon examination with tangent screen or hand perimeter. Two had gliomas, and a third had a subdural hematoma involving the function of the temporal lobe. Tests of foveal dark adaptation may therefore be of use for demonstration of visual-field defects before they can be demonstrated by ordinary tests of the visual fields. F. M. Crage.

Vail, Derrick. **Syphilitic opticochiasmatic arachnoiditis.** Amer. Jour. Ophth., 1939, v. 22, May, pp. 505-515; also Trans. Amer. Ophth. Soc., 1938, v. 36, p. 126.

13

EYEBALL AND ORBIT

Artemiev, H. I. **Pseudoneoplasms of the orbit.** Viestnik Opht., 1939, v. 14, pt. 1, p. 31.

A review of the literature and a report of a case of fibrous myositis of the orbit, causing exophthalmos and diagnosed as a neoplasm. The patient, a 34-year-old woman, had a right exophthalmos and pain in the orbit. At operation a tumor was not found and a biopsy of the external rectus established the diagnosis. The etiology of this disease is obscure; the author believes that it is a manifestation of chronic rheumatism.

Ray K. Daily.

Breuer, K. **Formation of cysts after exenteration of the eyeball.** Klin. M. f. Augenh., 1939, v. 102, Feb., p. 254.

The right eye of a girl of fourteen years had been perforated six years earlier by an accidental thrust with a manure fork, necessitating exenteration. About three years back a vesicle had developed in the orbit. It had gradually increased in size, without pain. It was opened and a yellowish fluid evacuated. A shrunken piece of sclera was extirpated, but the conjunctiva not sutured, so as to avoid renewed formation of a cyst. The entire inner surface of the piece of sclera was lined with pavement epithelium. It is considered probable that limbal conjunctiva (having pavement epithelium) was implanted by way of the suture.

C. Zimmermann.

Doherty, W. B. **A new orbital implant.** Amer. Jour. Ophth., 1939, v. 22, April, pp. 419-420.

Skydsgaard, H. **Exophthalmos coincident to intracranial tumors.** Acta Ophth., 1938, v. 16, pt. 4, p. 474.

A review of the literature and a tabulation of the author's own material, which comprised five cases of bilateral and nine cases of unilateral exophthalmos. The intracranial lesions causing the exophthalmos were a glioma of the temporal lobe, a carotid aneurysm, three tumors of the hypophysis, an acoustic neurinoma, and eight meningiomas.

Ray K. Daily.

Soliman, Farag. **Congenital ptosis, microcornea, colobomata of iris, choroid, and optic disc.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 199.

A case having all the above listed congenital defects is reported and the embryology of colobomata is briefly reviewed.

Edna M. Reynolds.

Tille, H., and Leroux-Robert, J. **Comparison between certain primitive orbital tumors and the so-called mixed tumors, or salivofacial glandular epitheliomas.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 595-629.

This report contains the results of a histologic study of a number of surgical specimens. The lacrimal glands, and the accessory lacrimal glands disseminated about the orbit, are a part of a regional system which includes the pituitary and salivary glands. The histologic characteristics of the tumors of the orbit are the same as those of tumors of the other glandular structures of the system. The acinocanalicular and canalicular forms possess the histologic characteristics and evolutionary history of the so-called mixed tumors of the rest of the system.

Clarence W. Rainey.

14

EYELIDS AND LACRIMAL APPARATUS

Adams, P. H. **Temporary alteration in refraction due to eyelid tumors.**

Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 736.

Five cases are presented with alteration in the refraction due to localized swellings of the upper lids such as chalazia and granulation tissue. In each case the condition returned to normal after the swelling disappeared.

Beulah Cushman.

Alvaro, M. E. **Treatment of recurrent styes by staphylococcus antitoxin.** Rev. Oto-Neuro-Oft., 1938, v. 13, Oct., p. 219.

The author reports the beneficial effect of staphylococcus antitoxin in the treatment of 27 instances of recurrent styes. The injections were first given subcutaneously, starting with a dosage of 0.1 c.c. of the antitoxin, and then intramuscularly as larger dosages were employed. The local, focal, and systemic reactions were carefully observed after each injection. In only two patients were untoward general effects noted. Edward P. Burch.

Bakry, M. M. El. **Tattooing replacing lacking lashes.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 99.

A line of lashes of the same color and thickness as the original one is drawn on the lid margin with India ink.

Edna M. Reynolds.

Bourguet, J. **Anatomical removal of the lacrimal sac.** Ann. d'Ocul., 1939, v. 176, Feb., pp. 109-126. (See Amer. Jour. Ophth., 1939, v. 22, April, p. 472.)

Cavallacci, G. **Concerning the pathogenesis of blepharochalasis.** Arch. di Ottal., 1938, v. 45, July-Aug., p. 171.

The author describes three juvenile cases and one senile case of blepharochalasis. He believes that the pathogenesis of the juvenile form is based on both local and general factors. The local condition is a weakness of the skin of the lid (a general deficiency in tone), especially of the fibro-elastic tissue. The general cause is believed to be a vasomotor and endocrine disturbance coincident with puberty. H. D. Scarney.

Czukrász, Ida. **About the sliding flap, known also as Hungarian plastic.** Trans. Ophth. Soc. United Kingdom, 1938, v. 58, pt. 2, p. 561.

The two Hungarian surgeons, Blaskovics and Imre, using different techniques, devised essentially the same methods for covering a skin defect, especially in replacing the anterior layer of the lower eyelid. (Diagrams, illustrations.) Beulah Cushman.

Dorofeev, V. H. **Recession of the levator in paralytic lagophthalmos in lepers.** Viestnik Opht., 1939, v. 14, pt. 1, p. 69.

A description of a procedure similar in principle to Golstein's operation. In six cases the results were satisfactory functionally and cosmetically. (Illustrations.) Ray K. Daily.

Granström, K. O. **Dacryocystitis in children, with particular reference to neglected congenital stenosis of the nasolacrimal duct.** Acta Ophth., 1939, v. 16, pt. 4, p. 512.

In nine out of 28 cases of dacryocystitis between the ages of one and fifteen years the etiology was untreated congenital stenosis of the nasolacrimal duct. The article contains also a report of a case of serpiginous ulcer with loss of vision, caused by nasolacrimal stenosis, in an infant 1½ years old.

Ray K. Daily.

Jayle, G. E. **Contribution to the study of acquired spasm of the levator mus-**

cle of the upper lid. Ann. d'Ocul., 1939, v. 176, Jan., pp. 1-17, and March, pp. 173-186.

Symptomatically, spasm of the levator muscle is important in localizing lesions affecting the upper lid. There is no absolute distinction between permanent and intermittent spasms, which sometimes are bilateral and sometimes alternating. In some cases a spasm of the levator which is permanent on looking ahead may relax on looking down and be replaced by retraction of the opposite upper lid. Spasm of the levator must be differentiated from sympathogenic widening of the palpebral fissure which involves the lower lid also.

Permanent and intermittent spasms have comparable but not identical pathogenesis. In bilateral cases the lesion is usually peduncular, in the region of the posterior white commissure. Monocular spasm is caused by lesions near the third-nerve nucleus, except in certain intermittent cases. It is difficult to determine the exact mechanism of these phenomena but they are probably related to disturbance in the functional associations of the levator nucleus. There may be associated neurological lesions in the oculomotor, postural, or vestibular systems.

John M. McLean.

Khalil, Mohammed. **Tarsitis syphilitica.** Bull. Ophth. Soc. Egypt. 1937, v. 30, p. 113. (See Amer. Jour. Ophth., 1938, v. 21, May, p. 590.)

Mitzkevich, L. D. **The technique of the Millingen-Sapeshko operation.** Viestnik Opht., 1938, v. 13, pt. 6, p. 848.

The author found the application of collodion to the skin of the lid very helpful in turning the cutaneous lip of the wound out and fixing it for the first two or three postoperative days. This position facilitates the taking of the intermarginal implant. Ray K. Daily.

Mohamed, I. A. **Meibomian glands—general pathology.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 127.

The meibomian glands are considered of paramount importance in the pathogenesis of indolent lid, corneal, and conjunctival affections in Egypt when the chronic inflammatory state of the conjunctiva is apt to initiate a seborrhea of the meibomian glands accompanied by excessive or altered secretion. The literature on the subject is reviewed. MacCallan's statement that the trachoma follicles which we are accustomed to call T. 2a are nothing but dilated ducts of the meibomian glands is refuted. Edna M. Reynolds.

Nastri, Francesco. **Treatment of staphylococcic affections of the eyelids by anastaphylotoxin.** Boll. d'Ocul., 1938, v. 17, Aug., pp. 663-673.

The writer reports the beneficial effect of staphylococcus anatoxin used hypodermically in 35 patients from 2½ to 56 years of age affected by ulcerative blepharitis or relapsing chalazia. In many cases the affection was an old one and did not respond readily to the usual remedies. (Bibliography.)

M. Lombardo.

Nižetić, Z. **Dacryocystorhinostomy in two sittings.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 71.

The method is described in detail.

Nižetić, Z. **Restoration of the lacrimal passages.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 67.

An operation for relief from obliteration of lacrimal canaliculi by intense trachomatous changes is described in

detail and illustrated. It is said to be simpler and cosmetically better than all other methods. C. Zimmermann.

Sander-Larsen, S. **Silk-cord treatment of blennorrhea of the lacrimal sac.** Acta Ophth., 1938, v. 16, pt. 4, p. 655.

Through a cannula the author passes a silk thread from the lacrimal punctum into the nose. Both ends of the thread are fastened on the face and the thread is cleansed daily merely by moving it about. The author finds this procedure adequate for dacryocystitis. (Illustration.) Ray K. Daily.

Schupfer, Francesco. **The Mikulicz syndrome.** Boll. d'Ocul., 1938, v. 17, June, pp. 452-483.

A woman of 29 years had noticed for about a month a slowly progressing enlargement of both lacrimal glands and the left parotid, and some tumefactions at the left angle of the mandible and in the left inguinal region. A microscopic examination of a specimen of the lacrimal gland showed a granulomatous tuberculous process. The author concludes that the process was due to tuberculous toxins. A second case is reported of a woman of seventy years who showed enlargement of the lacrimal glands and left parotid with bilateral exophthalmos of two years duration. A biopsy of the parotid and lacrimal gland showed a lymphomatous lesion. The author is of the opinion that this was a case of Mikulicz's disease. (Bibliography, 14 figures.)
M. Lombardo.

Seesy, A. M. El. **Gangrene of the eyelids.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 120.

Four cases of gangrene of the eyelids are reported. The disease was unilateral in all cases, and the ciliary margin of the lid was not affected. The cornea and conjunctiva remained intact in spite of the severe edema and profuse discharge. Edna M. Reynolds.

Seoud, G. A. El. **A new operation for trichiasis.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 97.

The tarsus is incised immediately below the roots of the cilia and parallel to the lid margin from the inner to the outer canthus and down to the muscle. The separation of the lid margin must be complete. The lid margin is then everted and fixed in position with three sutures. The operation is similar to the Panas operation but the skin and muscle are not cut. The method leaves a rough horizontal scar and is not suitable for operation on the upper lid.
Edna M. Reynolds.

Sobhy Bey, M. **Restoration of the eyebrow.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 108.

A pedicle flap from the temple was used to restore an eyebrow in a case in which extensive ectropion had previously been corrected by a Thiersch graft. Edna M. Reynolds.

Somerset, E. J. **The significance of errors of refraction in chronic blepharitis of children.** Brit. Jour. Ophth., 1939, v. 23, March, pp. 205-212.

Conclusions as based on refractive errors seen in 300 children aged from 2 to 13 years afflicted with blepharitis are: (1) There is no significant difference in the spherical refractive error of children suffering from blepharitis and that of the normal child. (2) The incidence of astigmatism is similar in blepharitis cases and normal children. (3) Uniocular cases do not show blepharitis more frequently in the eye with the greater ametropia. (4) Causes other

than errors of refraction must be sought for in blepharitis of children. (Tables, references.)

D. F. Harbridge.

Tikhomirov, P. E. **Anesthesia of the sphenopalatine ganglion in the therapy of ocular diseases.** Viestnik Opht., 1938, v. 13, pt. 6, p. 829.

A review of the literature is followed by brief reports of six cases of epiphora treated by injection of novocaine into the sphenopalatine fossa. Of three eyes with reflex epiphora there was improvement in one and complete relief in two. In one case with bilateral reflex epiphora there was no improvement. In four eyes with epiphora caused by anatomic changes in the lacrimal apparatus there was no effect from the injection.

Ray K. Daily.

Tiscornia, A., Just, B., and Mercandino, C. **Unusual development of an ethmoidal mucocele, with extension to the lacrimal passages.** Arch. de Oft. de Buenos Aires, 1938, v. 13, Sept., p. 485.

A 35-year-old female patient presenting a swelling in the lacrimal region was found to have a mucocele originating in the ethmoid cells. After becoming secondarily injected it extended into the orbit and involved the lacrimal sac and nasal cavity producing in effect a spontaneous dacryocystorhinostomy. The case was successfully operated upon. (Illustrations.)

Edward P. Burch.

Wheeler, J. M. **Correction of ptosis by attachment of strips of orbicularis muscle to the superior rectus muscle.** Arch. of Ophth., 1939, v. 21, Jan., pp. 1-5.

The operation described was devised for those cases in which the lid fails entirely to go up with the eyeball. An incision 25 mm. long is made in the skin at the level of the upper border of the tarsus, the skin undermined, and a horizontal incision made through the orbicularis muscle 4 or 5 mm. above the tarsus. The incision is then carried through the tarso-orbital fascia, the levator tendon, and Tenon's capsule to the sclera on either side of the tendon of the superior rectus muscle. The muscle is picked up on a squint hook and its superior surface exposed. Strips of orbicularis muscle 4 mm. wide and 10 mm. long are dissected up from the tarsus, and the ends toward the canthi are cut free. The attached ends are about 8 mm. apart. These strips of orbicularis are sutured to the upper surface of the superior rectus muscle with 000 chromic catgut. A moderate temporary lagophthalmos following the operation gradually disappears over a period of a few weeks. The operation gives a good contour to the upper lid without angulation. The steps in the operation are clearly shown by drawings. (Discussion.)

J. Hewitt Judd.

Wheeler, J. M. **Spastic-entropion correction by orbicularis transplantation.** Amer. Jour. Ophth., 1939, v. 22, May, pp. 477-482; also Trans. Amer. Ophth. Soc., 1938, v. 36, p. 157.

15

TUMORS

Dalsgaard-Nielsen, Esther. **Tumor of the sclera.** Acta Ophth., 1939, v. 17, pt. 1, p. 58.

A review of the literature and the report of a case of scleral angiofibroma in a 68-year-old woman. (Illustrations.)

Ray K. Daily.

Fledelius, M. **Metastatic hypernephroma of the uvea.** Acta Ophth., 1939, v. 16, pt. 4, p. 527.

A report of a metastatic choroidal tumor, the size of a hazelnut, situated temporally behind the ciliary body of the left eye. It occurred seven years after extirpation of the left kidney for hypernephroma. A review of the literature shows that only two cases of this neoplasm have been reported previously. Ray K. Daily.

Ibrahim, F. G. **Melanotic sarcoma of conjunctiva.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 143.

A case of melanotic sarcoma of the conjunctiva of the upper lid in a patient 65 years of age is reported.
Edna M. Reynolds.

Kryzlikova, P. K., Fishman, P. R. and Kaganova, O. A. **Radiotherapy of malignancies of the eye and its adnexa.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 90.

The authors summarize their results as follows: In tumors of the orbit radiotherapy is of but little avail; this is due to the small quantity of soft tissue and the anatomic structure of the orbit which make uniform distribution of rays impossible. Operable cases should be operated upon and followed by prophylactic irradiation; in inoperable cases irradiation should be administered for palliative reasons. Surgery is also indicated in malignant tumors of the eyeball, and irradiation should be reserved for tumors of only one eye. In malignancies of eyelids roentgenotherapy is preferable to operation; surgery and X-ray therapy combined give a more rapid effect than X rays alone. In cases in which surgery does not involve marked cosmetic or functional impairment surgery is more reliable, if only because patients cannot be relied upon to complete their irradiation treatment. Ray K. Daily.

Lund, Steffen. **Boeck's sarcoid in the tear sac.** Oft. Selskab i Köbenhavn's Forhandlinger, 1937-1938, pp. 46-51. In Hospitalstidende, 1938, Dec. 13.

Boeck's sarcoid, a rare disease, is characterized by multiple tumors of the skin, lungs, lymph glands, and other organs. In the eye, the conjunctiva, lacrimal gland, iris, uvea, and optic nerve have been known to be involved. Two cases are reported which showed typical appearances of this disease in general, and which also revealed bilateral involvement of the tear sacs. The sacs were swollen, partly obstructed, and contained clear but thick and tenacious secretion. D. L. Tilderquist.

Moutinho, H. **Melanocancer of the eye.** Bull. Soc. Franç. d'Opht., 1938, v. 51, pp. 491-507.

For the term "melanotic sarcoma" the author substitutes the term "melanocancer," which simply indicates a melanotic tumor of invading and malignant nature, without any histologic restrictions save the existence of melanotic pigment. The author states that all melanotic tumors of the globe have their origin in a pigmented spot derived from the pigmented epithelium of the retina, just as nevocancers of the skin are derived from epidermal melanoblasts. Melanotic tumors arise only in tissues of ectodermal origin.

The formation of melanin was studied in tissue cultures of melanosarcoma cells. The formation of melanin occurs endocellularly by condensation of the protein molecule with absorption of oxygen and loss of water, and is related to such amino acids as tyrosine, phenylalanine, and tryptophane.

The author describes four stages in the development of a melanocancer of the caruncle. Photomicrographs of tu-

mors of various parts of the eye, obtained from nine patients, are shown and described, and their varying histologic structure is interpreted as corresponding to one or other of the four stages in the development of nevocancer of the caruncle.

Clarence W. Rainey.

Pinkerton, F. J. **Malignant melanoma of the choroid with metastases.** Arch. of Ophth., 1939, v. 21, Jan., pp. 68-69.

A man aged 26 years had noticed a gradual reduction of vision for several weeks prior to the onset of an acute inflammatory glaucoma. A posterior sclerotomy was done and immediately a large herniating mass of dark-red or black material resembling clotted blood presented in the wound. This was found to be a melanoma, and the eye was enucleated. A recurrence in the orbit eleven months later necessitated a complete exenteration of the orbit. The patient died from metastatic involvement of the liver 26 months after his first visit. J. Hewitt Judd.

Sanders. T. E. **Mixed tumor of the lacrimal gland.** Arch. of Ophth., 1939, v. 21, Feb., pp. 239-257; also Trans. Sec. on Ophth., Amer. Med. Assoc., 1938, 89th mtg., p. 214.

A summary of cases previously reported especially as to symptomatology, clinical course, pathologic picture, and treatment is presented. A series of twelve cases of mixed tumor is reported, ten of which have been followed for more than two years. The clinical course in this relatively large series has proved to be consistent. Of eleven cases in which surgical treatment was employed, there was a recurrence in ten. One patient refused operation and died in six years with marked local invasion and metastases to the liver, lung, and mediastinum. Histologically, the growths seem identical with mixed tumors of other locations. Recurrence is probably due to incomplete removal because of the difficulty of surgical approach and the tendency for early bony invasion. Pathologically, the mixed tumors are probably a definite pathologic entity of dual origin, with the characteristic tendency of the epithelial element to become locally invasive. Early complete surgical removal is indicated as irradiation is not effective. (Photographs, photomicrographs, and discussion.) J. Hewitt Judd.

Tooke, F. T. **Melanoma of the iris with pathologic findings.** Trans. Amer. Ophth. Soc., 1937, v. 35, p. 56. (See Amer. Jour. Ophth., 1938, v. 21, July, p. 828.)

16

INJURIES

Abramovicz, I. **Localization methods in the eye.** Klinika Oczna, 1938, v. 16, pt. 6, p. 695.

A very thorough review of the literature. Ray K. Daily.

Czukrász, Ida. **Mechanical injuries of the eye.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 57.

Out of 100,000 cases in the eye clinic, 892 were caused by mechanical injuries which are here discussed.

C. Zimmermann.

Dollfus, M., Hudelo, A., and Paulin. **A case of severe alteration of the lens and eye by radium.** Arch. d'Opht. etc., 1939, v. 3, Jan., p. 40.

On May 24, 1935, a sailor 48 years old presented himself at the Radium Institute with an epithelioma of the lower lid of the left eye. Examination revealed a non-epidermoid epithelioma.

On the third of June radium treatment was instituted. The entire eyelid was protected with a sheet of lead 2 mm. thick, exposing only the margin of the lower lid. The treatment was ended on the eighth of June. A total dose of 27 hours was spread over six days; 20 to 25 millicurie doses, surface 12 sq. cm., distance 6 mm., 1-mm. platinum filter.

On April 9, 1937, the left eye showed symblepharon of the inferior conjunctiva and a narrowing of the inferior cul-de-sac. The cornea was desquamated throughout the entire lower segment, staining with fluorescein. Ocular tension was normal. On April 20, 1937, there was diffuse bullous keratitis with vascular infiltration, iridocyclitis, numerous synechiae, and an opacified lens. The eye became worse and a year later it had to be removed because of threatened perforation. Histologic examination of the removed eyeball showed: swelling of the anterior portion of the lens, crystalline masses, and innumerable uniform and regularly stippled spherules. The retina, which was normal throughout most of its extent, showed here and there pigmented lesions. There was pigment migration from the pigment epithelium toward the retina and choroid. The iris showed some chronic lesions in the region of the blood vessels and the latter showed true thrombotic areas. The ciliary body showed areas of atrophy, the cornea revealed desquamated epithelium and deep ulceration. (Illustrations.)

Derrick Vail.

Fenton, R. A. **Management of eye wounds at the front.** Military Surgeon, 1938, v. 83, Sept., p. 195.

Ocular-wound cases are divided into four classes. Medical treatment is mentioned, including the proper dressings. The author dwells on the selection of cases requiring treatment at the front or in field hospital or base hospital, as well as the time and place for surgical care when needed. F. M. Crage.

Kaplan, I. D. **First aid in lye burns of the eye.** Viestnik Opht., 1939, v. 14, pts. 2-3, p. 114.

The behavior of experimental burns on rabbits shows that the best first aid is profuse irrigation with water.

Ray K. Daily.

Kaplan, I. D. **Xanthopsia in acrichinin intoxication.** Viestnik Opht., 1939, v. 14, pt. 1, p. 120.

Five cases of intoxication occurred in an acrichinin manufacturing factory. Their clinical course, and a laboratory investigation on rabbits show that acrichinin has a tendency to color the tissues. In the rabbit it was demonstrated in the aqueous, vitreous, and retina. Observations among the workers show that it causes xanthopsia, if it gets into the anterior ocular segment. Introduced into the conjunctival sac it produces corneal erosions.

Ray K. Daily.

Kinukawa, Ch., and Matsuda, S. **Clinical and experimental observations on changes in the fundus caused by caterpillar hairs.** Graefe's Arch., 1939, v. 140, pt. 1, pp. 70-85.

A boy sixteen years old, after being struck in the left eye by a caterpillar, was observed for 2½ months with recurrent inflammation of the eye. At least five caterpillar hairs wandered back into the interior of the eye. A nodular formation in the iris occurred, typical of that caused by caterpillar hair. In the fundus, two white string-like formations occurred in the periphery and an inflammatory appearance of the papilla was noted. Experiments with rabbits showed similar symptoms

after holding the caterpillar against the superior limbus. The course of the inflammation was described in detail. Microscopic examination of enucleated rabbit eyes thus infected revealed first the presence of pus cells, and later a moderate grouping of epithelioid cells, rudimentary giant cells, and a surrounding proliferation of connective tissue. H. D. Lamb.

Lisch, Karl. **Participation of the eyeball in general chrysiasis.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 103.

A woman of 57 years suffering from lupus erythematodes, tuberculosis of the left lower lid, and left-sided sclerosing keratitis, had been treated from 1925 to 1934 with intravenous injections of aurophos, lopion, and solganal, and in 1937 with intramuscular injections of solganal. For four years the patient had noticed a bluish discoloration of the skin of the face, neck, and arms. In the conjunctiva and cornea were very fine glittering particles of gold, occupying all layers except the epithelium. The occasional inflammatory disturbances of the conjunctiva and cornea occurring under gold therapy are probably signs of intolerance or tissue reaction to deposition of gold salts. C. Zimmermann.

Medvedjev, H. I., and Natanson, M. C. **The diagnosis and management of double perforations of the eyeball.** Viestnik Opht., 1938, v. 13, pt. 6, p. 836.

From a review of the literature and 32 cases of their own the authors conclude that such injuries constitute 3 percent of all perforating ocular injuries. They are caused by firearms, and in industry by metal particles. The authors divide these injuries into three groups. Group one comprises the cases in which the foreign body lodges in the orbit outside of the eyeball: in this group the final result is more favorable than in the other groups. Group two includes the cases in which the foreign body lodges outside of the eyeball but touching the posterior perforation. To group three belong the cases in which the foreign body is caught in the lips of the posterior perforation. Orbital symptoms following a perforating ocular injury, in the absence of infection, are indicative of a double perforation: ophthalmoscopic evidence facilitates the diagnosis, but in most cases ophthalmoscopy is impossible. The magnet test is dangerous. Failure in magnet extraction of a foreign body localized deep in the eyeball is strongly suggestive of a double perforation of the first or second group. X-ray is very valuable. The clinical course and prognosis depend on the size, character, location, and chemical and biologic character of the foreign body. Ray K. Daily.

Melanowski, W. H. **Traumatic scleral cysts.** Klinika Oczna, 1938, v. 16, pt. 6, p. 739.

One of the author's two cases was of corneoscleral cyst, which developed two years after a perforating injury followed by iritis, traumatic cataract, and glaucoma. The second case was of a scleral cyst at the lower limbus, which had developed four years after loss of vision from absolute glaucoma following a blow on the eye with iron. Surgery resulted in a satisfactory cosmetic appearance in each case. (Illustrations.) Ray K. Daily.

Motolese, Francesco. **Bilateral paralysis of the external rectus muscle associated with papilledema from novocaine rachianesthesia.** Boll. d'Ocul., 1938, v. 17, Aug., pp. 629-634. (See Section 4, Ocular movements.)

Pelláthy, Béla. **Experiments to lessen the action of mustard gas.** Szemészet, 1938, v. 1, Dec., p. 48.

Experimental researches undertaken by the author to lessen the action of mustard gas upon the eye are said to prove that the immediate and copious use of water is the best antidote. The addition of various chemical substances was not followed by better results.

R. Grunfeld.

Sharkovski, I. A. **Dry gangrene as a complication of adrenalin medication.** Veistnik Opht., 1939, v. 16, pt. 1, p. 116.

The subconjunctival injection of 3 minims of adrenalin for a cataract extraction caused a disagreeable constitutional reaction and the operation was postponed. The following day the patient developed petechiae over the abdomen and chest, and dry gangrene of the skin on the back of the hands. The symptoms cleared in six days under atropine injection. The case demonstrates that in elderly patients adrenalin should be used with caution.

Ray K. Daily.

Shimkin, N. **Pontocaine, cause of professional eczema in oculists.** Ann. d'Ocul., 1939, v. 176, March, pp. 198-203.

Several cases of eczema of the lids are reported after instillation of pontocaine drops. The author acquired dermatitis of the hands from using pontocaine in his practice. Sensitivity was demonstrated in these cases by patch tests with the drug.

John M. McLean.

Thrane, Mogens. **Occupational conjunctivitis of film operators using "effect" carbon electrodes.** Acta Ophth., 1938, v. 16, pt. 4, p. 625.

Five cases of conjunctivitis associated with respiratory irritation are reported. This type of carbon electrode contains metallic copper, and the author attributes the disease to the mechanical effect of copper dust and not to the light intensity. Ray K. Daily.

Urrets Zavalia, A., and Obregon Oliva, R. **Chrysiasis (gilding) of the cornea during treatment with sanocrysine.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 94.

The authors report weekly slitlamp findings in the corneas of fifty patients with different types of pulmonary tuberculosis who had been treated with sanocrysine. They found the gold in two forms in the normal cornea: superficial crystals in Bowman's membrane and its immediate neighborhood, more numerous in the center, and a fine powder of reddish-brown particles in the deep layers and Descemet's membrane, in greater quantity at the periphery (perhaps metallic or colloidal gold or gold sulphite). C. Zimmermann.

Vannas, Mauno. **The localization of ruptures and foreign bodies in the fundus.** Acta Ophth., 1938, v. 16, pt. 4, p. 588. (See Section 10, Retina and vitreous.)

17

SYSTEMIC DISEASES AND PARASITES

Bailey, J. H., and Saskin, E. **An innocuous clinical entity simulating tabes dorsalis. Pupillotonia with absent tendon reflexes (Adie's syndrome).** Amer. Jour. Ophth., 1939, v. 22, May, pp. 499-504.

Bencini, Alberto. **The ocular behavior of rabbits vaccinated against tuberculosis and the introduction into the anterior chamber of tuberculous antigen.** Boll. d'Ocul., 1938, v. 17, Aug., pp. 613-628.

Different groups of rabbits were inoculated with tuberculous antigens, and these and control animals were then injected with virulent tubercle bacilli. The control rabbits showed a high percentage of choroidal specific foci. If Petragnani diagnostic anatuberculin was injected into the anterior chamber, a more diffuse and intense iris reaction followed than in the control rabbits. A greater degree of allergy in the vaccinated rabbits was demonstrated.

M. Lombardo.

Bessemans, A., and Van Canneyt, J. **Ocular tissue temperatures in the normal rabbit and in the rabbit affected with syphilitic keratitis.** Arch. d'Opht. etc., 1939, v. 3, Jan., p. 18.

Thermo-electric needles were inserted at various points in the ocular tissues of twelve normal rabbits, and in eight rabbits affected with syphilitic keratitis. A summary of the experimental results shows: (1) The tissue temperature in different parts of the rabbit eye differed considerably from animal to animal. (2) The anterior surface of the cornea and particularly the center had the lowest temperature. That of the deeper layers of the lid was a little higher. (3) The temperature of the internal portions of the eye, notably more elevated than that of the external portions, rose quickly on passing from the iris and sclerotic toward the retina and vitreous. This last appeared to have the highest temperature. (4) The internal membranes were more rapidly heated after closure of the lids. (5) These variations were observed without great discrepancy in the normal eye and in the eye affected with syphilitic pallidoiditic keratitis. Thus the deeper portion of the rabbit's eye is rarely invaded by syphilitic infection, because the spirochete is easily killed by high temperature in vivo. Conversely, since the cornea has a lower temperature than the interior of the eye it is more easily invaded by the spirochete. (Tables, bibliography.)

Derrick Vail.

Bietti, Giambattista. **Results of the interferometric method of the ocular endocrinologic field.** Boll. d'Ocul., 1938, v. 17, May, pp. 370-400.

The interferometric method lends itself to researches in series which, if conducted in a great number of cases, can give a hint to the possibility of glandular dysfunction and the relation of endocrinic group changes to some ocular diseases. Interstitial keratitis is found frequently associated with dysfunction of thymus and thyroid, and retinitis pigmentosa with changes in the hypophysis. In juvenile cataract, changes in the parathyroid prevail. In ophthalmic hemicrania the thyro-hypophyseal, gonadal, and suprarenal glands show changes. In spring catarrh and keratoconus, suprarenal, thyroid, and thymus dysfunction may be found. Insufficiency of convergence may be attributed to dysfunction of the hypophysis, of the thyroid, and in some cases of the gonads. (Bibliography.)

M. Lombardo.

Caramazza, F. **Experimental tuberculosis of the eyeball by inoculation with virulent human tubercle bacilli after passage through lymph glands of guinea pigs.** Boll. d'Ocul., 1938, v. 17, July, pp. 503-575.

The writer attempted to demonstrate the virulence in the eye of human tubercle bacilli after their passage through animals. Bacilli were inoculated into a peritracheal gland of a guinea pig and an emulsion of this was

inoculated into other guinea-pig glands and rabbit eyes. Further cross-inoculations between guinea-pig glands and rabbit eyes were repeated. Histologic examination of these eyeballs showed the presence of a tuberculous process. The writer describes the first ocular localization in relation to the site of inoculation, evolution of the obtained lesions, and virulence of the organisms during the various passages through animals. (Bibliography, 54 figures, 6 colored plates.) M. Lombardo.

Focosi, M. **The presence of volatile aromatic substances and the determination of their amount in blood serum.** Boll. d'Ocul., 1938, v. 17, May, pp. 337-349.

It is known that an extraordinary increase of aromatic substances is found in the blood of patients affected by some pathologic conditions. The writer mentions his method for determining the presence of phenols in the aqueous of rabbits, considers what importance these substances may have in the pathogenesis of certain ocular lesions, and mentions various types of lesion which are associated with increase or overproduction of these substances. Nephritic neuroretinitis manifests itself in subjects who show signs of renal insufficiency, and in such cases the blood shows a marked increase of phenols. It is possible that in these cases the ocular lesion is due to toxic action on the blood-vessel walls of the choroid and retina, so that the phenols might have importance in the pathogenesis of nephritic neuroretinitis. Pernicious anemia may show retinal changes possibly due to the same cause. A marked phenoluria is found in cases of colitis and the connection between the intestinal functions and ocular lesions of toxic origin is well known. Cataract following dinitrophenol intoxication may have a similar origin. (Bibliography.) M. Lombardo.

Galewska, Zofia. **A case of echinococcus cyst of the orbit cured by X-ray treatment.** Klinika Oczna, 1938, v. 16, pt. 6, p. 723.

A boy eleven years old suddenly developed loss of vision in the left eye with hemorrhages and opacities in the vitreous. A diagnosis of orbital echinococcus was made from hemotologic studies, and under X-ray treatment the fundus became normal and vision was regained. Ray K. Daily.

Green, John. **Ocular manifestations in brucellosis (undulant fever.)** Arch. of Ophth., 1939, v. 21, Jan., pp. 51-65; also Trans. Amer. Ophth. Soc., 1938, v. 36, p. 104.

After a brief historical account of undulant fever, the author discusses the diagnosis and therapy of this condition, reports four personal cases, and reviews all the cases in the available literature in which ocular complications occurred. Recently there has been developed an effective serum for the treatment of the disease in the acute stage and a vaccine for treatment in the chronic stage. The external ocular muscles, cornea, uveal tract, retina, and optic nerve have all proved vulnerable. However, enucleation can usually be avoided. Clinically as well as pathologically it seems to have a great similarity to ocular tuberculosis. (Discussion.) J. Hewitt Judd.

Jacovidès. **Ocular manifestations observed during the menopause.** Bull. Soc. Egypt, 1937, v. 30, p. 174.

Three cases of ocular symptoms related to the menopause are reported. The first showed a distinct loss of

visual acuity. Examination revealed general hyperemia of the retina and optic nerve, with two macular hemorrhages. The patient had a slight elevation of blood pressure. At the end of two months treatment with ovarian extracts, rest, and restricted diet, the retinal circulation was normal, and at the end of four months the vision had returned to normal.

The second case showed distinct loss of vision following a hemorrhage during menstruation. The eyegrounds showed diminution in the caliber of the vessels with general ischemia of the retina and optic nerve, and a cherry-red macula. Rest in bed, with ovarian medication and a series of strychnine injections, restored the vision to normal within two months time.

The third case had bilateral accommodative asthenopia, with negative fundus findings except for slight hyperemia. Treatment consisted of restricted diet and folliculine injections. Within three weeks the symptoms had disappeared. Edna M. Reynolds.

Koch, F. L. P. **Herpes zoster ophthalmicus.** Arch. of Ophth., 1939, v. 21, Jan., pp. 118-120.

A case is reported because the patient was only 5½ years of age. This boy presented a typical clinical picture with dermatitis of the left lid, keratitis, ischemia of the disc with edema of the subjacent retina, and many exudates in the macular area. J. Hewitt Judd.

Louffy, M., Fahmy, A. R., and Ismail, D. **Ocular manifestations of leprosy.** Bull. Ophth. Soc. Egypt, 1937, v. 30, p. 181.

The ocular findings in 293 cases of leprosy are listed. The eye signs are usually early and often aid in making the diagnosis. Loss of the eyebrows with changes in color and falling of the cilia occurred very frequently (in 222 cases). Thickening of the supraciliary margin with nodular elevations of the skin of the lids was also common. Paralysis of the orbicularis occurred in 34 cases. Lepra bacilli were constantly found along the eyelid margin and were at times found in parts of the conjunctiva and cornea which appeared normal. Entrance is through the epithelium of the conjunctiva or cornea to the uvea, with consequent loss of sight.
Edna M. Reynolds.

Napoleoni, Valerio. **Researches on the central and peripheral light sense in hepatic patients with and without icterus.** Arch. di Ottal., 1939, v. 45, Sept.-Oct., p. 258.

Using the adaptometer of Engelking and Hartung, the author tested the light sense in hepatic patients and discovered abnormal values only in those patients who showed icterus.
H. D. Scarney.

Sivko, M. T. **Involvement of the optic nerve and retina in botulism.** Viestnik Opht., 1938, v. 13, pt. 6, p. 861.

A report of a case in which the ocular symptoms were paralysis of accommodation with normal pupillary reaction, lowered visual acuity, contracted field, and a relative peripheral ring scotoma. The fundus presented a picture similar to that of retrobulbar neuritis passing into atrophy. Recovery took place under retrobular injections of atropine.
Ray K. Daily.

Stroschein, E. **Filaria loa in the eye.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 111.

A woman affected with filariasis

asked to have a filaria, whose movements she felt for a few minutes in her right lower lid, immediately removed without any preparation. Under the thin skin a fine linear elevation about 2 cm. long could be seen parallel to the lid margin. It showed lively movements. Through a 4-mm. incision a white filaria, 0.5 mm. thick and 40 mm. long, was extracted with iris forceps. After three months the patient had another filaria removed elsewhere. As filaria loa is viviparous, the young microfilarias circulate in the blood of the patient. If such a patient is stung by a blood-sucking insect, the latter becomes infected and propagates the parasite. Filaria loa is found only on the west coast of Africa, and is exclusively conveyed by flies of the species chrysops. C. Zimmermann.

Zaffke, K. H. **Hemeralopia as a symptom of thyrotoxicosis and diseases of the liver.** Deut. Arch. f. Klin. Med., 1939, v. 183, pt. 4, pp. 433-447.

In 22 thyrotoxic individuals, dark-adaptation tests showed the presence of hemeralopia. It has been recently shown that in thyrotoxic individuals injury to the liver occurs, and since the liver is important for the storage of vitamin A, it is concluded that the thyrotoxic hemeralopia is the result of the thyrogenic injury to the liver. Hemeralopia was found to be present in five cases of cirrhosis of the liver and in seven cases of icterus from other causes such as catarrhal jaundice, congestion of the liver, and cholangitis. The degree of hemeralopia is dependent upon the amount of injury to the liver. In cirrhosis of the liver, hemeralopia occurs in such characteristic amount and form as to serve in differentiating cirrhosis of the liver from all other hepatic disorders. H. D. Lamb.

18

HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Beach, S. J. **American ophthalmology grows up: turbulent years from 1908-1915.** Amer. Jour. Ophth., 1939, v. 22, April, pp. 367-373; also Trans. Amer. Ophth. Soc., 1938, v. 36, p. 175.

Furniss, Austin. **The school ophthalmic service.** Brit. Jour. Ophth., 1939, v. 23, April, pp. 256-272.

Basing his presentation on the fact that the eye and the ear are the chief gateways of learning, the author discusses in a lengthy article the ophthalmological service rendered by the school with which he is associated. The school deals with children over five years of age, while the health visitor checks the children under that age in their homes. Findings as to the vision in young children are presented, as are experiences with the Snellen test, examination, and treatment; myopia as found among the children of the school being given full discussion and description. Tables.) D. F. Harbridge.

Gutentag, Stanislaw. **Schools for children with trachoma in Lodz.** Klinika Oczna, 1939, v. 17, pt. 1, p. 113.

The author proves statistically the effectiveness of special schools, for children with trachoma, in eliminating the disease. In addition to providing treatment the schools take into consideration the child's visual abilities in setting up the curriculum.

Ray K. Daily.

Harman, N. B. **The findings of eye examinations, 50,000 cases.** Brit. Med. Jour., 1939, Feb. 11, Supplement, pp. 65-66.

The results of examination of 50,000 unselected cases by the British Nation-

al Eye Service during the past five years are analyzed and presented in table form. Of this total, 63.65 percent showed errors of refraction only, 27.68 percent showed errors of refraction plus other eye conditions, 7.9 percent showed other eye conditions only, and 0.77 percent showed no appreciable defect. A discussion of the importance of good eyesight in industry concludes the article. George A. Filmer.

Heinonen, O. **Hereditary blindness and its prophylaxis.** Acta Ophth., 1938, v. 16, pt. 4, p. 535.

A survey of the incurably blind in Finland shows that in 25 percent of them the disease is hereditary. The author believes that the occurrence of several cases of hereditary blindness in successive generations justifies sterilization of the diseased. Compulsory sterilization of blind persons whose hereditary factor is recessive is neither effective nor desirable, because normal people carrying the recessive factors far outnumber those actually diseased. Ray K. Daily.

Houwer, A. W. M. **Peculiarities of well-known ocular diseases in the Netherland East Indies**. Arch. of Ophth., 1939, v. 21, Feb., pp. 235-238; also Trans. Amer. Acad. Ophth. and Otolaryng., 1938, 43rd mtg., p. 188.

The most prominent differences in behavior and frequency between the ocular diseases of Europeans and those of the natives are presented. Insufficient food of the poor natives is responsible for xerophthalmia, but racial, climatic, and other circumstances are probably responsible for differences in the incidence and course of cataract, trachoma, acute conjunctivitis, gonorrheal conjunctivitis and iritis, syphilis, tuberculosis, leprosy, and tumors of the eye. It is pointed out that geographic ophthalmology promises to be an interesting science. J. Hewitt Judd.

Lavos, George. **Waiving compensation rights.** Outlook for the Blind, 1938, v. 32, Oct., p. 128.

Compensation laws have caused employers to become very selective in hiring workmen, and especially careful as to hiring those with obvious physical disabilities such as loss of an arm, a leg, or an eye. Six states have included compensation waivers in their workmen's compensation laws. In three of the states, Connecticut, Wisconsin, and Ohio, the waiver provides that compensation shall be given to the blind if the accident is not attributable to the blindness.

The author concludes that the effect of the waiver has not been too encouraging. Employment for a handicapped person depends on his individual competence, or, lacking this, takes the form of "sheltered employment such as stand concessions." F. M. Crage.

Law, F. W. **"Egyptian ophthalmia."** Brit. Jour. Ophth., 1939, v. 23, Feb., pp. 81-95.

First there is here presented a selection of comments appearing in the literature relative to opinions of various authorities as to the nature of the ophthalmia under discussion. Chief among these quotations is a lengthy letter over the signature of William Ferguson as written in November, 1809. This letter describes a spurious ophthalmia self-inflicted by soldiers to escape service in the Irish army, risking self-imposed blindness in order to draw a life pension and evade further army obligations. The author thereupon differentiates between the factitious ophthalmia described by Ferguson and the true dis-

ease with which Staff Surgeon Vetch was contending. The author concludes that it was undoubtedly from Egypt that the infection came which proved such a scourge in the European outbreaks referred to in the references in the forepart of the article. (References.) D. F. Harbridge.

Leydhecker, F. J. **Contribution to the history of ophthalmology. The literary sources of Nieden's reading tests.** Graefe's Arch., 1939, v. 140, pt. 1, pp. 129-140.

Almost all the German eye physicians use the reading tests of Adolf Nieden. Nieden was born in 1846, was an assistant to Saemisch, and practiced ophthalmology in Bochum from 1847 until he moved in 1902 to Bonn, where he died in 1915. The first of his reading tests was published in 1882. In the present article, the author reveals the literary source of many of the brilliant and inspiring German quotations that Nieden employed. H. D. Lamb.

Mettenheim, H. **Reminiscences of Albrecht von Graefe, with ten letters from him.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 117.

These letters and reminiscences were left by Carl von Mettenheimer, who was an assistant of Johannes Müller and a friend of Graefe. They are published by the recipient's son. The letters were addressed to von Mettenheimer and to G. Passavant.

C. Zimmermann.

Piekarski, Cz. **The spread of trachoma and the fight against it in Italy.** Klinika Oczna, 1939, v. 17, pt. 1, p. 119.

The prevalence of trachoma in Italy is very high, and it is on the increase, as shown by statistical data on candidates for military service. The activities against trachoma are far below those in Poland. Ray K. Daily.

19

ANATOMY, EMBRYOLOGY, AND COMPARATIVE OPHTHALMOLOGY

Brodsky, Isadore. **A description of a monster, diprosopus tetrophthalmus.** Brit. Jour. Ophth., 1939, v. 23, April, pp. 250-256.

Brodsky reports the case of an uncommon monstrosity, the fetus of a white female. The external features are described and illustrated, a short description being given of the internal anatomy, and the microscopic appearance of the median eyes. Radiographic features, with reproductions of the radiographs, are also presented. The monster displayed an eye on each side of the head, which was in the nature of two heads in one, there being a central or median block containing two eyes. (Illustration.) D. F. Harbridge.

Hudelo, André. **Histology of the choriocapillaris.** Ann. d'Ocul., 1939, v. 176, March, pp. 186-190.

Careful microscopic studies confirm previous statements that vessel walls in the choriocapillaris are composed entirely of endothelial cells. The few intercapillary fibrils are not intimate parts of the walls. The idea that all the nuclei in these capillary walls are toward the sclera is not borne out.

John M. McLean.

Spyratos, Spyridon. **Some contributions to the angioscopy of the eye.** Klin. M. f. Augenh., 1939, v. 102, Jan., p. 35.

After withdrawing the blood from living rabbits under chloroform narcosis, the author injected the whole head with Kaiserling-Ceelen solution and made vertical and flat serial sections of the sclerocorneal region, using

for the histologic examination Pappenheim's panoptic staining. Two separate vascular systems, conjunctival and episcleral, were distinguished in these specimens. Both systems show different characters and courses. They approach the sclerocorneal margin, but do not unite to form a common net. The conjunctiva of the upper lid shows a superficial anastomosing plexus of fine vessels, and under this larger branches from which the fine plexus arises. Toward the retrotarsal fold and on the bulbar conjunctiva extends only the fine superficial plexus so that in the underlying loose connective tissue there is an avascular space. Toward the sclerocorneal margin the superficial system approaches the underlying episcleral anastomoses by thicker branches but they do not unite. The deep episcleral vessels have a straighter course, are wider than the conjunctival, and anastomose at the limbus to form a wide plexus. C. Zimmermann.

Volokonenko, A. I. **Adult changes in human conjunctiva.** Viestnik Opht., 1939, v. 14, pt. 1, p. 19.

Microscopic studies of conjunctiva at various ages show that conjunctival morphology varies with the external environment. In intrauterine life the fibrous component of the conjunctiva consists of loose delicate collagenous bundles. After birth in response to external irritants a cellular infiltration appears in the subepithelial layer, and the number of argyrophile fibers increases, forming a complete layer under the basal membrane. The rapid development of fibers is made possible by the presence of large numbers of mesenchymatous cells which are endowed biologically with marked reactive ability. As these changes progress in the subepithelial layer the conjunctiva assumes an adenoid structure, and the adenoid tissue is very responsive to various irritants. The bulbar conjunctiva has but few argyrophile fibers and the subepithelial layer does not become adenoid; the adult changes are insignificant and confined mostly to the limbus. The transition folds contain the largest number of active elements, and therefore respond rapidly to comparatively mild irritants which produce no change in the bulbar conjunctiva. The senile change consists in the substitution of collagenous for argyrophile fibers.

Ray K. Daily.

NEWS ITEMS

Edited by Dr. H. Rommel Hildreth
640 S. Kingshighway, Saint Louis

News items should reach the Editor by the twelfth of the month

Deaths

The death of Mr. Donald Gunn at an advanced age is noted. While the younger generation of ophthalmologists, no doubt, have not heard of Mr. Gunn, the older men in this practice remember him as noted in his field but self-effacing to a noticeable degree.

Dr. Harry Elmo Peterman, Baltimore, Maryland, died February 25, 1939, aged 67 years.

Dr. Edward Jay Bernstein, Detroit, Michigan, died March 30, 1939, aged 75 years.

Miscellaneous

The staff of the Illinois Eye and Ear Infirmary, 908 West Adams Street, Chicago, Illinois, announces an intensive five-day course on glaucoma, which will begin on September 11, 1939.

The course will be limited to 10 physicians who are practicing ophthalmology, either with or without otolaryngology. Registrants will be accepted in the order of the receipt of their applications.

The course will last for five days, from 9:00 o'clock in the morning until 5:00 in the evening. Lunch will be included, during which a round-table discussion will be conducted. The course is designed to be of a practical nature. Only two hours a day will be devoted to lectures. Registrants will receive practical instruction and practice on patients in the different methods of diagnosis. Various types of surgery for glaucoma will be demonstrated by the attending staff, following which the registrants will practice the same operations upon kittens' eyes, under the supervision of the attending surgeon.

Each registrant must bring his own ophthalmoscope and, if available, his own tonometer. Other material will be supplied.

The fee for the course is $75.00, payable at the time of the registrant's acceptance.

The Section on Ophthalmology of the College of Physicians of Philadelphia announces the S. Lewis Ziegler Prize. This is an award of one hundred dollars for the best piece of original work in ophthalmology accomplished in any one year from October 1st to September 30th, inclusive.

Descriptive reports to be submitted anonymously at the first meeting of the Section in October to duly appointed judges who shall make their award or report not later than December 31st of that year.

The interest only of this endowment fund when amounting to one hundred dollars shall constitute the prize.

The report or reports submitted shall in the discretion of the judges be of sufficient merit or importance to justify the award; otherwise, the interest accruing above the requirement of one award shall be turned back to the principal sum.

The touring members of the Ophthalmological Society of the North of England were entertained by the staff of the Brooklyn Eye and Ear Hospital on May 1st to 4th. The program included surgical clinics, eyeground clinics, demonstration lectures, and pathology presentations. It was truly a pleasure to meet this fine representative body. Brooklyn eye men hope the group will be able to come again and spend a longer time with them.

The following symposium on visual fatigue was held by the National Research Council, 2101 Constitution Avenue, Washington, D.C., on May 20-21, 1939: Walter R. Miles, Laboratory of Physiological Psychology, Yale University School of Medicine, New Haven, Connecticut, The visual fatigue problem; George Wald, Biological Laboratories, Harvard University, Cambridge, Massachusetts, The chemical basis of visual adaptation; Clarence H. Graham, Psychology Laboratory, Brown University, Providence, Rhode Island, Frequency of nerve-impulse discharge as a function of time after onset of illumination; Selig Hecht, Laboratory of Biophysics, Columbia University, New York City, Relation between visual acuity and illumination; Brian O'Brien, Institute of Optics, University of Rochester, Rochester, New York, Iris measurements; P. G. Nutting, Jr., Research Laboratories Eastman Kodak Company, Rochester, New York, The influence of flicker fatigue on flicker frequency; Alfred Bielschowsky, The Dartmouth Eye Institute, Dartmouth Medical School, Hanover, New Hampshire, Influence of fatigue on the mechanism involved in binocular coöperation; Walter R. Miles, Laboratory of Physiological Psychology, Yale University School of Medicine, New Haven, Connecticut, Variations in the polarity-potential of the human eye; Frank K. Moss, Lighting Research Laboratory, General Electric Company, Nela Park, Cleveland, Ohio, Visibility and ease of seeing; Ross A. McFarland, Fatigue Laboratory, Harvard University, Soldiers Field, Boston, Massachusetts, The effects of anoxia on certain visual functions; Miles A. Tinker, Psychology Laboratory, University of Minnesota, Minneapolis, Minnesota, Visual fatigue in the reading of print; Walter F. Dearborn, Psycho-Educational Clinic, Harvard University, Cambridge, Massachusetts, On the relations of visual fatigue in reading disability; Robert K. Lambert, Eye Institute, Columbia University, New York City, The spasmogenic tendency and its effect on the eyes; Harry M. Johnson, Department of Psychology,

Tulane University, New Orleans, Louisiana, Rival motions of the nature of physiological impairment. This two-day conference was held at the suggestion of The Committee on Scientific Aids to Learning of the National Research Council.

The British Journal of Ophthalmology expresses its intention of establishing a bureau for the collection of case notes concerning retinal detachment. Mr. Charles Gordon will serve as chairman for the small committee contemplated while Mr. H. B. Stallard will act as secretary.

The American Optical Company has just published a booklet entitled "The ophthalmoscope and studies of the fundus oculi in important pathological conditions" which presents a series of fundus oculi studies, showing pathological changes from normal frequently encountered in diagnostic work.

The charts contained in the booklet were drawn by an artist in anatomy under the direct supervision of an ophthalmologist of wide reputation. They depict actual cases observed in one of the large medical centers.

Although the book is not intended, in any sense, to be a treatise on ophthalmoscopy, the company hopes that the skill and fidelity with which the artist has depicted a number of common diseases in their incipient stages and the clarity with which the author has described these fundamental conditions will prove helpful.

The American Optical Company presents this study as an interesting contribution to current literature on ophthalmoscopy. Copies can be obtained free of charge from the company.

Societies

At the regular business meeting of the Washington Ophthalmological Society on March 6, 1939, the following men were elected to office for the year 1939-40: president, Dr. Ernest Sheppard; vice-president, Dr. Frank D. Costenbader; secretary-treasurer, Dr. E. Leonard Goodman; executive committeeman, Dr. L. Conner Moss.

At the meeting of the Society on April 10, 1939, the following nationally known ophthalmologists addressed the members and guests: Dr. W. L. Benedict of the Mayo Clinic, on Lesions of the eyeball following operation on the Gasserian ganglion for relief of trifacial neuralgia; Dr. Walter B. Lancaster of Boston, on The management of a case of glaucoma; Dr. John Green of St. Louis, on Ocular manifestations of undulant fever.

At a recent meeting of the Buffalo Ophthalmologic Club the following officers were elected: president, Dr. James C. Fowler; vice-president, Dr. Meyer H. Riwchun; secretary-treasurer, Dr. Cheldon B. Freeman.

A general assembly of delegates and of all members of the International Organization against Trachoma, of which due notice had been given, was held at the Royal Society of Medicine, 1 Wimpole Street, London, on April 21, 1939.

There were present: Drs. MacCallan (president), Wibaut (secretary-general and treasurer), Nordenson and Pfluger (International Council of Ophthalmology), Goodman (League of Nations), Bailliart (International Association for the Prevention of Blindness, also representing France), de Grosz (representing Hungary), Gradle (representing the United States of America), Lauber and Melanowsky (representing Poland), Rohrschneider (representing Germany), Maggiore (representing Italy), Khalil, El Kattan, and Tahir (representing Egypt).

The minutes of the last meeting held in Cairo in December, 1937, were read and approved.

The accounts were examined and approved.

The new statutes, a draft of which had been previously sent to every delegate and member, were approved.

It was decided that the president and secretary-general should remain in office until the next Concilium Ophthalmologicum, when an election will be held to fill these offices and those of members of the council.

A discussion of importance by many members of the assembly took place. It was decided to delegate Dr. MacCallan to write a *brochure* on the subject of trachoma destined for general practitioners in trachomatous countries. Dr. Gradle suggested that the cost of the necessary illustrations might be borne by certain corporations which he proposed to interest in this project.

The next meeting of the council of the organization was decided on: this will be held in Paris at the same periods as those of the International Council of Ophthalmology and of La Société Française d'Ophtalmologie.

The next scientific meeting of the organization will be held during the period of the next Quadrenniel Congress of the International Ophthalmological Congress in Vienna, in 1941.

The eighteenth annual scientific and clinical session of the American Congress of Physical Therapy will be held September 5, 6, 7, 8, 1939, at the Hotel Pennsylvania, New York City. Preceding these sessions the Congress will conduct an intensive instruction seminar in physical therapy for physicians and technicians—August 30th to September 2d.

Personals

McGill University announced the appointment of S. Hanford McKee, Professor of Ophthalmology, in charge of the department.

Dr. Thomas Hall Shastid, Duluth, Minnesota, who has been confined to bed for more than eight months by a very severe attack of multiple neuritis, is beginning to show improvement. He expects to be up and back at work again in about two months.

PRESCRIPTION OPTICIANS